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Review of Evidence on Implementation in Education

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Review of evidence on implementation in education

Evidence review

April 2024

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Executive summary

Background

'Implementation in education' refers to active and planned efforts to introduce and sustain an approach in schools. It therefore involves making, and acting on, evidence-informed decisions. There is substantial evidence indicating that quality implementation amplifies the effectiveness of a range of school-based approaches. However, implementation in schools is complex and there is a need to know more about how to do implementation in schools well. It is important to understand how new approaches can be selected and put in place in school settings to improve outcomes for all pupils, including those from more disadvantaged backgrounds. There have been few reviews of research to date that take a holistic view of implementation across multiple intervention and school types. The EEF commissioned this evidence review to underpin an update to its guidance report 'Putting Evidence to Work: A School's Guide to Implementation'.

Aims of the evidence review

The evidence review aims to address two overarching questions:

1. How should school leaders and teachers understand implementation and how should they implement evidence-informed approaches in their context to have the best chance of improving all pupils' outcomes?
2. What is the relationship between content ('what') and process ('how') within school implementation?

To address these two questions the evidence review is organised into four inter-related 'work packages'. Because schools are complex, adaptive systems involving a diverse range of individuals, investigating implementation in schools needs to focus on context to understand what works for whom, where, and why. This realist perspective is reflected in our approach throughout.

Work Package 1

Work Package 1 reviewed existing literature and drew upon stakeholder involvement to conceptualise implementation in education.

Methods

Systematic review methods were used to locate and synthesise literature that included theories, models, and frameworks applied to implementation in schools. Seven electronic databases were searched: ERIC, Education Research Complete, British Education Index (via EBSCOhost), and the broader databases EMBASE, MEDLINE and PsycINFO (via OvidSp), and Social Science Citation Index (via Web of Science). This was supplemented by handsearching key journals, searching websites for grey literature, and recommendations from experts in the field.

Two independent reviewers selected studies by title and abstract screening and then full text screening. The inclusion criteria specified reporting of a theory, model, or framework, English language, and varied on review study design or education settings. Data extraction focused on details of included studies and the theories, models, and frameworks used in them. Quality appraisal used either the Mixed-Methods Appraisal Tool or the CASP systematic review checklist according to study design.

A system map synthesis showed key factors involved in implementation in education and the relationships between them. System maps are theories of change that provide thinking tools to explore causal links on a topic. We also produced a descriptive synthesis of the theories, models, and frameworks that have been applied to understanding implementation in schools in the reviewed literature.

Findings

A total of 79 school-based studies and a further 28 reviews were included. There were concerns in relation to the quality of some reviews. By comparison, most empirical studies were of good quality. Our descriptive synthesis reported on the 14 theories, models, and frameworks ('TMFs') that appeared across more than one included school implementation study or implementation review. The TMF most frequently appearing was the Consolidated Framework for Implementation Research (CFIR).

To develop the system map we synthesised the 79 included school-based empirical studies and reviews, extracting further information around the key factors of implementation addressed in the study that were associated with implementation or intervention outcomes. The system map provides a mid-range theory (expected to be applicable across different settings) that includes 101 factors important to school implementation and indicates causal relationships between them. It highlights key areas of implementation in schools—foundations, intervention-related factors, and implementation processes—which occur at distinct phases of implementation such as during exploring, preparation, delivery, monitoring, or sustain phases.

Work Package 2

Work Package 2 involved a survey and interviews and focus groups with school leaders and experienced users of the existing EEF implementation guidance report.

Methods

Three phases of data collection and analysis were completed. Phase 1 involved a survey completed by school leaders. This was sent to a stratified sample of schools in England and included 32 main questions about the respondent and their school, a recent example of implementation in their school, and about implementation generally. It included both quantitative and qualitative responses. Phase 2 used semi-structured online interviews with some of the survey respondents to find out more detail about an example of implementation and factors that impacted this. Several of these school leaders were interviewed on two occasions to consider changes over time. Framework analysis was used to analyse this data. Phase 3 involved focus group feedback sessions with Research School Network members and people from other organisations that have used the current 'Putting Evidence into Practice: A Schools Guide to Implementation' guidance report. Thematic analysis was used to present feedback themes.

Findings

One hundred and two surveys were completed by school leaders. Schools prioritised staff buy-in and intervention fit when selecting approaches. While most schools planned for new approaches, planning often fell on senior leadership with less involvement from pupils, parents, or external support. School leaders felt they allocated sufficient time for staff preparation and there was strong agreement that staff were trusted and supported as they initially tried the approach in practice. While most schools felt their approaches were effective, there were challenges in formally monitoring impact, despite efforts to gather feedback from staff, pupils, and families. Respondents would value further guidance on supporting staff to problem-solve and on embedding a school culture that supports improvement. Survey respondents tended to find the existing EEF implementation guidance report useful.

Twelve interviews and a further four follow-up interviews were completed. We found that successful interventions were simple, consistently delivered, and had strong staff buy-in. Effective implementation also required ongoing adjustments, leader engagement, and activities to sustain the approach. Conversely, interventions that struggled lacked staff support, fit poorly with the setting, or had high staff turnover. Interview findings suggest that while every situation is different, there are common factors that influence how well an intervention is implemented. Schools that adopted pre-designed programmes benefited from structure and support, while those that created their own approach had better fit and staff buy-in.

Six focus groups with 28 participants found positive feedback overall. Users requested more help selecting an intervention, using research evidence, and further guidance on how to use the associated resources. Additionally, they felt unclear on the structure of implementation teams and wanted more guidance on both the 'explore' stage and the use of strategies. Sharing misconceptions, mistakes, and non-examples was felt to be helpful for schools.

Work Package 3

Work Package 3 located and mapped key features of existing reviews of implementation in education and empirical studies that were included in Work Package 4.

Methods

Systematic review evidence and gap map methods were used to locate and map literature that reports on implementation in education. Seven electronic databases were searched: ERIC, Education Research Complete, British Education Index (via EBSCOhost), and the broader databases EMBASE, MEDLINE and PsycINFO (via OvidSp), and Social Science Citation Index (via Web of Science).

Study selection involved title and abstract screening and then full text screening completed by one reviewer after an intensive piloting phase. The inclusion criteria specified research studies and systematic reviews focused on implementation in education institutions for 3- to 18-year-olds. Studies needed to report the impact of school implementation factors, processes, or strategies. We excluded studies that were not written in English or relevant to contemporary education in England.

Data extraction included design, country, school phase, intervention category, intervention outcomes, implementation outcomes, implementation factors, and implementation strategies. Quality appraisal used either the Mixed-Methods Appraisal Tool or AMSTAR 2 according to study design.

We produced two evidence maps. Evidence maps involve a systematic search of a broad field of literature to summarise the literature and identify gaps in knowledge or areas for future research, presenting results in a user-friendly format.

Findings

Fifty-seven reviews of implementation populated the first evidence map to indicate where these reviews have information in relation to intervention categories, school phase, implementation factors, implementation strategies, implementation outcomes, and intervention outcomes; most focused on primary or secondary age groups and a range of different intervention categories. Reviews tended to report on fidelity and adoption implementation outcomes and behaviour pupil outcomes most often. Intervention fit, professional development, and buy-in were implementation factors and strategies most often reported in these reviews.

Evidence Map 2 includes the 293 studies from the Work Package 4 synthesis. The studies tended to focus on whole-school approaches rather than targeted approaches, and teaching and learning approaches were the most common type studied. Fidelity, acceptability, and adoption implementation outcomes were reported most often. Studies were more likely to be located in the U.S.A. than the U.K. While a similar number of studies provide evidence for the three key contexts reported in Work Package 4, 'reflecting' was the mechanism evidenced most often across studies. Involving students, family members, and other staff was the specific implementation strategy most often evidenced in the included studies. Both reviews and empirical studies tended to be of high quality.

Work Package 4

Work Package 4 conducted a realist systematic review, developing and refining an evidence-informed programme theory that indicates key contexts and mechanisms that lead to improved implementation and intervention outcomes. Work Package 4 also reviews the impact of implementation strategies, indicating how and when strategies can be used to support implementation.

Methods

Realist reviews are interested in developing and testing how *mechanisms* lead to *outcomes* in particular *contexts*. A realist review methodology suits the purpose of the current review because realist reviews explain why implementation is effective rather than only the extent to which it is effective. Realist reviews involve two broad stages: theory development and theory refinement. Theory development work took place through Work Packages 1 to 3 and led to an initial programme theory. The refinement stage elaborated, specified, and tested out the initial programme theory using evidence from reviews and empirical research to develop a refined programme theory that explains what works, for whom, and in what context in relation to implementation in schools.

We drew upon our previous searches for literature followed by bespoke database searches and citation analysis to identify relevant reviews and empirical literature that would provide evidence for contexts, mechanisms, and outcomes of relevance to implementation in schools and the initial programme theory. To find additional relevant research, we checked reference lists from included reviews, consulted literature recommended by experts, accessed EEF evaluation reports, and examined citations from recent papers on school implementation strategies.

The inclusion criteria specified research studies and systematic reviews focused on implementation in education institutions for 3- to 18-year-olds. Studies needed to report the impact of school implementation factors, processes, or strategies. We excluded those that were not written in English or relevant to contemporary education in England.

Study selection involved full text screening. Once we had a final list of included studies against the refined programme theory, a second reviewer checked that each included study did evidence the aspect of a context-mechanism-outcome configuration that had been indicated in the data extraction and synthesis. Data extraction involved both study details and thematic analysis coding techniques to record which included studies evidence which elements of the refined programme theory. Quality appraisal used either the Mixed-Methods Appraisal Tool or AMSTAR 2, according to study design. We used Confidence in the Evidence from Reviews of Qualitative research (CERQual) to assess the quality of our own realist review findings.

To develop the refined programme theory, we consolidated over 60 context, mechanism, and outcome configurations aligned with the initial programme theory. The refined programme theory brought together key contexts, mechanisms, and outcomes that were relevant across phases and domains of implementation. Through additional searches, feedback from stakeholders, and synthesis of implementation strategies we refined the programme theory further, making minor changes to wording in relation to contexts and mechanisms.

Findings

Two hundred and ninety-three papers were included in our realist synthesis. While the quality of included reviews and empirical studies was generally good, studies rarely isolate implementation factors or strategies to assess their impact alone. We also found more evidence of implementation factors and strategies impacting implementation outcomes, rather than directly upon pupil outcomes.

Our refined programme theory suggests three broad contexts and three broad mechanisms that interact, impacting implementation outcomes and, in turn, intervention outcomes. The three contexts are:

- enabling structures—systems and support that allow for effective implementation;
- intervention features—characteristics of interventions that predict conditions for implementation; and
- agents for change—conditions in which actors are empowered or can facilitate this in others to play key roles in implementation.

The three mechanisms are:

- engaging—voices, interest in implementation, and collaboration;
- reflecting—on data, including concerns, successes, and needs; and
- uniting—views, values, and understanding about implementation and the intervention.

We hold high confidence in our contexts 'enabling structures and mechanisms', 'uniting', and 'reflecting'. We hold moderate confidence—meaning some slight concerns about the evidence—for the other constructs. 'Implementation climate' is also a broader property of this interaction between contexts, mechanisms, and outcomes. We found evidence that implementation in schools is both influenced by previous experiences of implementation and beliefs about future implementation, while any current experience of implementation shapes beliefs.

We also applied our refined programme theory to assess the impact of implementation strategies. This analysis allowed for further refinement of the programme theory, exploring whether the contexts and mechanisms can relate to implementation strategies. We focused on 34 strategies from Cook et al.'s 'Strategies, Translating ERIC Resources' (SISTER) project, which had some evidence for their impact in our included studies. The synthesis considered each strategy in turn and evidence for how the programme theory explains the implementation strategy. The refined programme theory was evidenced as relevant to all strategies assessed, however, this tended to be rated as low or moderate confidence, often because of the adequacy or coherence of study data in relation to the strategies.

Time and leadership were identified as key overarching factors across the refined programme theory and use of implementation strategies.

Discussion

The evidence review indicates how implementation in schools is complex in that school settings interact with the approach being implemented, something which affects the choice and use of particular implementation strategies and tools. There is a delicate balance in relation to adapting an intervention to help with fit and feasibility while at the same time respecting its core components. Schools should view implementation as an ongoing process of adaptation and inquiry, not just a linear set of steps or the moment an approach is introduced in practice. This includes revisiting aspects like staff buy-in and data collection throughout the process to ensure successful implementation. Additionally, schools may need to be empowered to make evidence-informed decisions about what they will implement and how they will implement it in their setting. The refined programme theory indicates evidence-informed overarching principles for effective implementation. 'Enabling structures', 'agents for change', and 'intervention features' can be shaped to support implementation. While, 'engaging', 'reflecting', and 'uniting' are mechanisms relevant across a range of actions that can drive successful implementation in schools.

Chapter 1. Background and review rationale

Introduction

It is five years since the Education Endowment Foundation (EEF) published 'Putting Evidence to Work: A School's Guide to Implementation' (EEF, 2018). Since then, the guidance has been accessed widely and is cross-referenced by the majority of EEF guidance reports focused on evidence-based practices. It also informs Research School training programmes and regional partnerships. Additionally, the implementation guidance report has been used by other school-facing organisations (e.g. Ambition Institute, TeachFirst), informed guidance in other countries, and, since September 2021, has underpinned the mandatory implementation module across the new National Professional Qualifications (NPQs).

Although the guidance has been well-received, it needs updating to capture insights from recent implementation research and explore implementation practices in English schools to develop and refine the current recommendations. There are opportunities to draw on other areas of research relating to effective implementation, including translating educational research into practice, school improvement, and school leadership. Equally, a range of theories, models, and frameworks from broader fields like implementation science and behaviour change may help to further the understanding of implementation in education. There are also opportunities to make improvements to the guidance based on feedback from people who have used it.

The EEF therefore commissioned this evidence review to help update the evidence and inform a new revised guidance report. The aims of the review are twofold. The first is to explore how school leaders and teachers understand implementation and how they should implement evidence-informed approaches in their context to have the best chance of improving all pupils' outcomes. The second is to understand better the relationship between content ('what') and process ('how') within school implementation. These are elaborated later in this opening chapter. Before that, we discuss the importance of implementation in education and how understanding from related fields such as school improvement and knowledge mobilisation in schools as well as thinking from separate fields—including implementation science and behaviour change—have been informing understanding and practice of implementation in education.

Implementation in education

The implementation of evidence-informed practice is recognised as key to school leadership and improvement but challenging (Brown et al., 2017; Collins and Coleman, 2021; Furlong, 2014; Scott and McNeish, 2013; Stoll et al., 2015). There is substantial evidence indicating that, when implemented well, the effectiveness of a range of school-based programmes increases in terms of the targeted outcomes (Durlak and DuPre, 2008; Wilson et al., 2003), as well as attainment (Banerjee, 2010; Durlak and Wells, 1997; Dyssegaard et al., 2017). It is therefore important to understand more about how new approaches, interventions, resources, and strategies can be selected by school leaders and put in place to best maximise the chances of sustained success for all pupils, including those from more disadvantaged backgrounds.

Implementation in schools is complex and hard to do well (Chong and Lee, 2021). Research on school improvement plans and their implementation (Strunk et al., 2016) recognises challenges in implementing, monitoring, and sustaining planned change. Similarly, studies in knowledge mobilisation recognise the difficulties of putting evidence into use in education, despite improvements in the quality of educational research (Gorard et al., 2020). Implementation tools for use in schools (including guidance and practical strategies) have been reported to be too complex for use by school staff and need to be adaptable to fit school needs (Leeman et al., 2018). When efficacious interventions are used they often are not implemented the way they were designed (Stahmer 2007), or what is implemented in schools tends to be a combination of different evidence-informed strategies that have not been tested in combination (Chasson et al., 2007). The inability to realise and maintain change has been attributed both to school leadership capacity for sustaining change (Williams, 2009) and to teacher resistance to change (James and Jones, 2008). Inconsistent implementation in schools is also often argued to be due to barriers to interventions fitting school context (Lendrum and Humphrey, 2012). While much research has identified barriers and facilitators to implementation, theory is rarely used to guide understanding of these factors (Weatherson et al., 2017).

Given these challenges, it is clearly important to learn more about how to do implementation in schools well. 'Implementation' is one among a wide range of terms including 'diffusion', 'dissemination', 'knowledge mobilisation', and 'research translation', often used in similar ways in education and beyond (Flaspohler, 2008; Tetroe et al., 2008). However, there is some level of agreement that implementation refers to active and planned efforts to mainstream an innovation in an organisation in contrast to 'diffusion' (passive spread) and 'dissemination' (active and planned efforts to persuade target groups to adopt an innovation: Greenhalgh et al., 2004). Other definitions of 'implementation' emphasise that the innovation ought to hold prior evidence that it is effective and that the implementation process spans the transition from appraising evidence about an approach to its use in real-world settings (Albers et al., 2017; Sanchez-Flack et al., 2020).

This review has used a working definition of school implementation drawing on previous definitions indicated and agreed with the EEF guidance report panel: ‘making, and acting on, evidence-informed decisions’. This definition implies planned action but also multiple decisions spanning the consideration of which approach to implement and evidence of its effect as well as multiple evidence-informed decisions about how the approach should be implemented. We assume these decisions happen across phases of implementation from selecting approaches, planning, acting, monitoring, and evaluating the effects and sustaining the approach (or not) (Aarons et al., 2011), although these phases may not always be distinct. Evidence-informed decisions happen within—and sometimes beyond—the school as a system (Gu et al., 2021). Decisions may be made by individuals (Hall and Hord, 2005) or be collective decisions informed by a range of viewpoints (Chambers et al., 2013). Other key terminology indicated in our working definition includes ‘evidence-informed’, which we define as drawing upon robust research and theory—which may often include both academic evidence as well as more local evaluation (Nelson and Campbell, 2017; Owen et al., 2022). Compared to ‘evidence-based’, which tends to imply supportive research evidence for an approach, evidence-informed practice is an approach to educational decision-making that critically appraises different forms of evidence to inform key decisions (Brown et al., 2017; Greany and Maxwell, 2017). We also use the term ‘approach’ to indicate the diverse range of interventions, strategies, policies, practices, and resources that schools may implement. These will range from whole-school approaches (e.g. trauma-informed approaches; Moore et al., 2021) to more targeted support (e.g. interventions for autistic students; Fishman et al., 2017) and highly specified programmes (e.g. physical activity programmes; Lane et al., 2022) to pedagogical innovations (e.g. feedback in maths; Sutherland et al., 2019).

Implementation and education literature

There have been significant advances in understanding implementation in recent decades driven by implementation science studies mostly conducted in healthcare settings. Implementation in education has had less examination in comparison. However, there are signs that this has been changing, with ideas often originating outside of education informing practice and research in schools (Leeman et al., 2018).

Theories, models, and frameworks

A range of theoretical papers have explained the adoption of innovations in schools since the 1970s. A wide range of frameworks exist to support the implementation of evidence-informed practice, with some papers reporting over 100 theories or frameworks in existence (Birken et al., 2017). Nilsen (2015) provides a well-used taxonomy that categorises theories, models and frameworks into one of:

- process models—guide the process of translating research into practice;
- determinant frameworks—describe determinants that influence implementation outcomes;
- classic theories—theories typically from other fields like psychology and sociology that describe how change occurs;
- implementation theories—explain certain aspects of implementation, such as organisational climate, behaviour change of individuals, integration into everyday practice; and
- evaluation frameworks—frameworks that provide a structure for evaluating implementation.

Various types of framework from this taxonomy have been applied to implementation in education. For instance, the Quality Implementation Framework (Meyers et al., 2012) is a process model that forwards 14 steps to inform high quality implementation and has informed a framework for scaling up in educational reforms (Redding et al., 2017). Similarly, the Consolidated Framework for Implementation Research (CFIR; Damschroder et al., 2022) is a determinant framework which has recently been updated. It identifies immediate and broader factors affecting implementation success and has also been applied to education, for instance to provide a framework for evaluating factors that affect implementation of school programmes (e.g., Hudson et al., 2020; Wilhelm et al., 2021). Meanwhile, the theory of diffusion, which helps describe the process by which a new practice is communicated over time among members of a social system (Rogers, 2003), has been applied to explain the spread of innovations in education, including how school policy is implemented (Harriger et al., 2014).

An ‘implementation theory’ as described by Nilsen (2015) includes those developed to explain certain aspects of implementation such as actors’ behavioural or organisational climate. Normalisation process theory (NPT; May and Finch, 2009) is an example which has been used to identify barriers to organisational change in schools (Wood, 2017). NPT identifies four mechanisms which are considered crucial in implementing, embedding, and integrating new practice: coherence, cognitive participation, collective action, and reflexive monitoring. Another implementation theory that is particular to school settings is the concerns-based adoption model (Hall, 1974). This model provides tools to predict and address concerns that teachers may have over time (Hall and Hord, 2005). Finally, evaluation frameworks provide a structure for evaluating implementation. The RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, Maintenance; Glasgow et al., 1999) specifies implementation aspects that might be evaluated in intervention studies and has been applied to a range of school-based evaluations (e.g. Kennedy, 2020; Merrell, 2006). When implementation frameworks are applied in educational settings it is important that their relevance to the particular context (both setting and intervention) is considered (Harriger et al., 2014; Heitink et al., 2016).

Implementation strategies

The use of theoretically informed implementation strategies can improve the impact of evidence-informed practice (Kirchner et al., 2020; Smolkowski et al., 2019). The Expert Recommendations for Implementing Change project (ERIC; Waltz et al., 2015; Powell et al., 2015) categorised implementation strategies used in health-related contexts. This has since been adapted for implementation in schools and assessed, recognising the subtle and not so subtle differences across health and education settings (Cook et al., 2019; Lyon et al., 2019). Of course, there are important differences in structural, social, environmental, and economic conditions across schools, so while a comprehensive list of strategies (75 in total) is a valuable resource for schools, further exploration of how strategies work alongside and in response to contextual influences, including the characteristics of interventions, is important. This may help to develop the kinds of support strategies which will maximise the agency, autonomy, and connection amongst and between school communities (Chapman and Ainscow, 2019).

Equity

Understanding how implementation strategies can promote equitable implementation and pupil outcomes across communities is a particularly important challenge (Gaias et al., 2021). As indicated above, school contexts are shaped by complex economic, social, geographic, and political factors (Pickett and Wilkinson, 2010) so the resources and capacities which schools can draw on to support implementation vary. There are diverse practical examples of tools and resources for overcoming economic and social challenges in relation to implementation (Miller et al., 2020; Raviv et al., 2022) but threaded throughout all of them is the key role that community members play in shaping implementation to their own needs and context through processes of collaboration, cooperation, and communication. These will help to indicate how and when a setting may be more or less likely to require additional support and what forms of support may be most effective and why (Baumann and Cabassa, 2020). Moreover, establishing how underlying assumptions and values within implementation strategies may exacerbate inequalities may help school stakeholders to better establish them and address the root causes of disparities and inequalities present in implementation. Meaningful and ongoing discourse between stakeholders across the scope of implementation from the development of an intervention to end-users and pupils plays an instrumental role in equity and related processes (Gaias et al., 2021). Specifically, it can contribute to closing two key fundamental gaps in education, namely that between socioeconomic status and achievement and that between research and practice.

Behaviour change

To understand interventions and improve their outcomes it is necessary to understand the behaviour of those involved in the intervention and how this behaviour ought to change. Behaviour-change techniques are most often applied to health-related human behaviours, but models of behaviour change have been applied to school-based interventions. The Behaviour Change Wheel (BCW) and Theoretical Domains Framework (TDF) provide a systematic and comprehensive assessment of factors that are likely to influence behaviours. The BCW is a synthesis of 19 frameworks of behaviour change and is based on a Capability Opportunity Motivation Behaviour (COM-B) model. The COM-B model assumes that interactions between an individual's capability, opportunity, and motivation can explain why a particular behaviour is or is not performed. It has been applied to physical activity interventions in schools (McDermott et al., 2022; Helme et al., 2022). The Theoretical Domains Framework (TDF; Cane et al., 2012; Michie et al., 2005) provides a framework to explain barriers and facilitators of behaviour in any situation. It has been used in many contexts to understand behaviour and design theoretically informed interventions, including school settings where it has been used to understand the barriers to implementing healthy school food policy (Reilly et al., 2018).

Systems

A number of the theories, models, and frameworks mentioned thus far employ a systems approach to implementation. For instance, the CFIR acknowledges and describes different characteristics of the inner setting (e.g. structure, communication and culture in a school) and the outer setting (e.g. school policy and funding). The 'exploration, preparation, implementation, sustainment' framework (EPIS; Aarons et al., 2011) also recognises variables in the inner and outer context. For schools, individual classrooms, teachers, and child and family characteristics might be considered 'inner contexts'. 'Outer contexts' refers to factors broader than the individual building or classroom, such as national policies, leadership structures, and funding sources (Goldstein and Olszewski, 2015). Inner and outer factors are seen to be interconnected in the EPIS model and characteristics of interventions are evaluated for goodness of fit within organisation systems. In a related way, the CFIR model considers the nature of the intervention, recognising that factors such as evidence strength, adaptability, complexity, and cost will predict whether an intervention will be successfully adopted in a system. A popular systems framework applied to implementation in education (Durlak and Dupre 2008) sees intervention characteristics as influenced by and interacting with school characteristics, which in turn are influenced by and interact with community factors. This has been applied to the implementation of physical activity and mental health support in schools (Naylor et al 2015; Owens et al., 2014). Despite recognising systems, it is worth noting that studies of implementation in practice often assess different levels of influence separately, rather than their interaction (Nilsen, 2015).

Schools are complex ecological systems (Mason, 2008) so implementation of any school-based intervention cannot be seen as a linear process from adoption to outcome. Understanding school implementation must account for schools' systemic nature, including factors such as agency, context, and emergence (Koh and Askell-Williams, 2021). By taking a complex adaptive systems lens, schools are understood as a complex whole, greater than the sum of their parts and behaving in a non-linear fashion (Mason, 2008). Schools evolve as they implement evidence-informed approaches (Moore et al., 2019). Evidence-informed practices interact with the people, setting, and point in time in schools as they are introduced, thereby changing the dynamics of the system (Hawe et al 2009).

Understanding implementation in schools therefore needs to focus on context, barriers, and enablers as well as the specifics of the implementation process. To take this view a step further, theorists adopting a complexity science lens would characterise school systems as uncertain and unpredictable (Greenhalgh and Papoutsis, 2019). Taking the view that schools are complex, adaptive systems does not render implementation as unique to each school or something that cannot be planned. Instead, it implies a need to consider the resilience and adaptability of schools to system change and the components that help schools to sustain an approach in practice after the initial implementation efforts to put the approach may have ended. These components include engagement and involvement of stakeholders, adaptability and flexibility to manage change, and formation of collaborative partnerships (Koh and Askell-Williams, 2021). This approach to understanding schools as complex adaptive systems recognises the interaction between various agents in the system (e.g. the DfE, school leaders, teachers, parents, pupils, external collaborators) which can inform decisions about continuation or discontinuation of ways of working (Murphy et al., 2018).

Knowledge mobilisation

Knowledge mobilisation has emerged as a field to understand the interactive processes of developing and connecting knowledge from research and practice to drive improvement (Campbell and Levin, 2012). It is important to consider how evidence is put into use in education as this has been considered a specific barrier despite improvements in the quality of educational research (Gorard et al., 2020). Bridging gaps between research and practice is clearly important for the implementation of evidence-informed approaches (Esmail et al., 2020); however, knowledge mobilisation recognises the interaction between producers of research, users of research, and intermediaries such as think tanks and unions. Four key capacities are necessary for research to inform and improve practice: it needs to be accessible, understood, spread, and lead to action. Much research activity focuses on dissemination, which has been described as 'active and planned efforts to persuade target groups to adopt an innovation' (Greenhalgh, 2004) rather than support to put evidence into practice. This is important for implementation, not only for the selection of the right evidence-informed approach to fulfil a need but because this support can alleviate barriers to implementing innovations such as the complexity of the intervention and the quality of evidence and design.

Moving beyond the research communication, two reviews of reviews on evidence-informed decision-making indicate that supporting access to, and communication of, research evidence is only effective when there are also attempts to enhance decision-makers opportunity and motivation to use the evidence (Langer et al., 2016). Similarly, interventions building decision-makers' skills to access and make sense of evidence were only effective to increase evidence use if the intervention also tried to enhance both capability and motivation to use research evidence. This work shows the relevance of behaviour change—it draws on the capability-motivation-opportunity-behaviour (COM-B) model—to engaging with research evidence as part of the implementation process. Furthermore, a conceptual framework for research use in education sees quality research evidence use as comprising the interaction between appropriate research evidence and thoughtful engagement and implementation (Rickinson et al., 2020). This model takes a systems view, acknowledging that there are enabling components at the individual level (such as skills and relationships) and the organisational level (such as leadership and culture) and that there are interactions between these levels of the school system.

The Quality Use of Research Evidence framework sees engagement and implementation of research evidence happening within a complex system in education which sees an interaction between individuals and their organisations (Rickinson et al., 2020). Furthermore, the generation and use of evidence itself can be thought of as a system that can change (Gough et al., 2019). How research is initially produced relates to how research evidence is used and vice versa. Just as schools might be considered complex adaptive systems, the evidence ecosystem is dynamic with different components interacting creating feedback loops that may sustain or change practice. The socio-political context is important as research use in schools involves intermediaries such as policymakers and What Works Centres rather than only an exchange of ideas between other researchers producing relevant evidence and school decisionmakers seeking evidence (Gough et al., 2018). This is supported by Nelson and O'Beirne's (2014) earlier rapid evidence review of knowledge mobilisation in education. They recognised that effective knowledge mobilisation would require social and behavioural change by both researchers and school staff recipients of research knowledge.

School Improvement and leadership

There is a distinction between effectiveness researched in terms of the impact of specific interventions on pupil outcomes and school effectiveness as a field of research and practice that demonstrates that the most effective schools

are those that plan and enact implementation (Day et al., 2009). Implementation of evidence-informed practice is recognised as key to school leadership and improvement (Furlong, 2014), schools are continually aiming to improve, which implies the relevance of implementation research and practice. However, understanding of implementation as a key factor in school leadership and improvement is far from new (Fullan, 1992). Research has focused on school improvement plans and their implementation (Strunk et al., 2016), recognising challenges in implementation, including for monitoring, and sustaining planned change. This implies that schools may have relevant data about what they have decided to adopt, and how this has been implemented and sustained and the facilitators and barriers to this.

Theory in relation to school improvement and school leadership is relevant to implementation in education. However, when school improvement focuses on mandated reform across schools in a particular authority, region, or country, or measures are implemented in underperforming schools, then schools do not hold agency in relation to what they implement and therefore parts of the implementation process—like exploring needs and selecting approaches—are less relevant and particular contextual challenges may be faced in relation to buy-in to an approach (Ryan Jackson et al., 2018).

School leadership theory can also inform the implementation of evidence informed ideas when more focused on leaders' behaviours and skills, as opposed to how school infrastructure should be organised (Grissom et al., 2021). A wide range of school leadership styles have been identified (Marzarno et al., 2005). Several more prominent styles emphasise certain aspects of implementation and are therefore important to acknowledge. Transactional leadership often sets goals, clarifies expected outcomes, consults with stakeholders, and provides feedback and recognition (Marzarno et al., 2005). Instructional leadership focuses on ensuring that teachers have resources and support to enhance teaching and learning (Robinson et al., 2008). Transformational leadership is assumed to produce results based on expectations and involves relational and social engagement, embodying a human-centred approach and involving followers in the change process. Transformational leadership affects staff attitudes, behaviours, and organisational assumptions (Pietsch and Tulowitzki, 2017). Distributed leadership has ties with transformational leadership but focuses less on the school leader's style and more on what teachers and school leaders do together, acknowledging that leadership can occur at all levels in a school and that creating the conditions to enable those with expertise to share in leadership practice is advantageous (Larsson et al., 2023). There has been a range of critiques of leadership styles, including varying evidence of impact associated with particular styles and the need to consider leadership as relational, negotiated, and context-specific (Gordon and Patterson, 2006). Leadership theory, therefore, speaks to factors that might impact implementation and implies relevance of a range of leadership behaviours rather than only selected styles (Patterson et al., 2021).

Reviews

Despite the level of interest and relevant fields informing our understanding of implementation in education, there have been few reviews of research that take a holistic view of implementation across multiple intervention and school types. There are systematic reviews that focus on implementation of particular interventions in schools, for example, classroom management (Hepburn et al. 2019), diabetes care (An et al., 2021), and whole-school curriculum reforms (van Kuijk et al., 2021). These often restrict their reviews further to a particular country's education system or a particular age group. Other school-based implementation reviews have focused on implementation phases or outcomes, for example, the adoption of daily physical activity policies (Olstad et al., 2015) and sustaining public health interventions (Herlitz et al., 2021).

There have been several reviews focusing on understanding implementation in schools more broadly. Dyssegaard et al. (2017) conducted a systematic review to examine what enables or promotes implementation, or the use of evidence-based knowledge, in primary and lower secondary education; 34 studies were included and a narrative synthesis was conducted. This pointed to six factors that can enable or hinder implementation in schools, namely management and leadership, professional development, support from consultants or coaches, fidelity, teacher attitudes and beliefs about a programme, and sustainability. The authors argued that all six thematic areas are of vital importance to the process of implementation in schools, ranging from putting specific interventions into practice or developing processes for using evidence-based knowledge more generally. In examining the state of the field, Dyssegaard et al. (2017) also conducted a comparison of policies and strategies for implementation in schools across ten different countries. They found that use of research was highly related to local school norms, with strategies varying from centrally controlled knowledge transfer to bottom-up models of knowledge transfer.

In the same year, Albers and Pattuwage (2017) conducted a systematic scoping review exploring whether implementation strategies used in school settings have improved teaching or student outcomes and whether implementation quality is related to these outcomes. The review included studies across primary and secondary school settings; 36 studies were included, with only eight of these focused on implementation strategies. Strategies such as professional development and ongoing staff support were found to impact student outcomes when delivered with fidelity or considered acceptable in terms of relevance and important by users and stakeholders. Included studies demonstrated a positive relationship between the quality of programme implementation (often fidelity) and pupil outcomes. One study also indicated how school leadership support was related to positive student outcomes. Both reviews seem to indicate that the number of studies exploring implementation in schools is limited, which conflicts with the range of reviews with more focused inclusion criteria on particular school interventions.

A couple of other reviews have also focused on the relationship between implementation outcomes and pupil outcomes. Killerby and Dunsmuir (2018) systematically reviewed studies which correlated or directly compared the level of implementation of school-based interventions with pupil outcomes. The review also considered how researchers measure implementation in schools. They located 13 studies that reported this. They found some evidence that when a range of different school-based programmes are implemented with higher fidelity this is associated with or predicts improved pupil outcomes. However, the magnitude of the benefits varied across studies and there were issues with study quality and varying measures of fidelity. The conclusion about the impact of implementation outcomes on intervention outcomes fits with Durlak and DuPre's (2008) broader review of prevention and health promotion. They also found a link between fidelity and dosage and programme outcomes. Interestingly, they found that monitoring fidelity (versus not) is associated with better programme outcomes.

Meanwhile, Anders et al. (2017) reviewed the outcomes of published EEF-funded trials. Of relevance to the current evidence review, its quantitative and qualitative analyses were interested in relationships between contexts, mechanisms, and outcomes. The qualitative analysis considered intervention characteristics and implementation factors including sustainability to inform intervention and trial design. The analysis identified the importance of factors such as senior leaders' understanding and commitment to interventions, high quality intervention materials, timing is convenient and timescales are realistic, flexibility to adapt interventions to school systems, professional development, and ongoing monitoring and support.

Similarly, Maxwell et al. (2021) reviewed EEF-funded trials that incorporated implementation and process evaluations, seeking to measure the quality of implementation evaluations in EEF evaluations. As well as proposing a measure of quality focused on sufficiency of data sources, data collection methods, sampling, analysis, and conduct, the review assessed the quality of evaluations. Maxwell et al. (2021) report variation in the quality of implementation evaluations, with quality increasing over time. Sampling and analysis methods were the elements of evaluations that were least likely to be rated as high quality.

Finally, in addition to other reviews mentioned that consider implementation in education, three reviews we located prior to our own synthesis have considered implementation strategies. However, each of these focuses on either particular strategies or interventions. Kretlow and Bartholomew reviewed studies considering the impact of coaching as an implementation strategy to improve pre-service and qualified teachers' practice. They identified twenty relevant studies and concluded that highly engaged, small-group initial training followed by multiple observations, feedback, and modelling are likely to improve fidelity as an implementation outcome. Relatively few studies provided data and analysis to show coaching as having a causal impact on student attainment.

Merle et al. (2002) focused across a range of strategies but in relation to social, emotional, and behavioural interventions in schools: 28 single case experimental designs were included and their meta-analysis indicated that implementation strategies were associated with increased teacher fidelity compared to baseline and group professional development on the intervention in question. They also showed that greater fidelity was associated with implementation strategies that used more behaviour change techniques (for example, performance feedback, practice, or goal setting). This review showed the benefit of multiple implementation strategies and how such strategies can be considered using behaviour change theories.

Baffsky et al. (2023) conducted a systematic review of strategies used to implement mental health promotion or prevention programmes in school settings. They used the recent taxonomy of implementation strategies, the School Implementing Strategies, Translating ERIC resources (SISTER) framework (Cook et al., 2019) to categorise the implementation strategies used in included studies; 21 studies were included. They found evidence that 22 of the strategies were effective in improving adoption or fidelity across the included studies, with promising strategies including audit and providing feedback, engaging principals as local opinion leaders, improving teachers' buy-in, and organising regular school team intervention meetings. While the review indicates that SISTER can be used to categorise implementation strategies researched prior to the development of the framework, it reveals difficulties in establishing the difference between some strategies, for example, audit and providing feedback versus developing instruments to monitor implementation or local technical assistance versus ongoing coaching.

This summary of reviews to date about implementation in education shows how they often draw upon disciplines such as implementation science theories, models and frameworks, behaviour change, knowledge mobilisation, and implementation strategies. However, there is a gap for a more holistic evidence review that cuts across the range of intervention types and education settings for 3- to 18-year-olds. There is also a gap for considering how implementation in education has been theorised in literature, school leaders' experiences of implementing new approaches in English settings, and considering both evidence for implementation strategies used in education settings and how these often broad strategies can be used in effective ways to improve different implementation outcomes.

Aims of the evidence review

As stated above, this evidence review aims to address two overarching questions.

1. How should school leaders and teachers understand implementation and how should they implement evidence-informed approaches in their context to have the best chance of improving all pupils' outcomes?

This research question captures both understanding and action. This is important as implementation is a process that moves from decisions over what innovation to adopt, through various steps involved in putting it into practice, to evaluation of whether to sustain the change and scale up further. Important factors are located at different levels of the school system, including external influences. There is much to consider, while the actions taken need to avoid unnecessary complexity and be perceptive to the particular school¹ and intervention context. The framing of this research question helps to focus on implications that will be relevant to the EEF guidance report work.

2. What is the relationship between content ('what') and process ('how') within school implementation?

Content in terms of 'what' schools may implement is important to consider throughout the evidence review. Some intervention features can assist implementation while others may not be very implementable in schools. Factors such as the compatibility of the intervention with a school's priorities and values and the extent to which positive and necessary adaptations are possible to fit the needs and preferences of a school show the interaction between intervention content and how schools decide what and how to implement (Durlak, 2016). Characteristics of the intervention, like evidence supporting the intervention, its relative advantage compared to current practice, broad costs, and complexity, will impact on implementation across contexts (Leeman et al., 2018). Interventions that schools may implement range from whole-school approaches to more targeted support and highly specified programmes to pedagogical innovations, indicating that the challenges in implementation will vary according to what is being introduced. It is therefore important to recognise what is being implemented as a key context that may inform the specific implementation considerations and action.

Structure of the evidence review

To address these two questions the evidence review is divided into a series of interrelated reviews and primary research culminating in a focused systematic review. We structure the Evidence Review according to four work packages (WPs). Figure 1 provides an overview of the work packages and their interrelationships.

Work Package 1

Work Package 1 (WP1) involved defining what we mean by 'implementation' in a school or education context and identifying factors that are thought to potentially influence effective implementation in schools, recognising how they are thought to connect to one another. We did this by systematically locating and reviewing literature that describes theories, models, and frameworks explaining implementation that can, or have been, applied to implementation in education. The EEF guidance report panel fed into this work by discussing what is in scope, recommending key literature and generating key ideas anticipated in the synthesis. Using this theoretical and conceptual literature alongside engagement and input from the EEF guidance report panel, we developed a system map depicting school implementation factors and the relationship between these factors. The system map helped to visualise how many implementation processes cut across stages or timeframes, contextual factors, the nature of the intervention, and the characteristics of individuals or groups involved. WP1 helped inform all further WPs. The system map informed interview questions in WP2, implementation factors to map in WP3, and informed an initial programme theory for the realist review in WP4.

WP1 addressed the following research questions:

- How can existing implementation theories, models, and frameworks explain the interaction between school context and implementation outcomes?
- How should we define and conceptualise school implementation?

It therefore contributes to addressing the first overarching research question about school leaders understanding implementation. The system map synthesis also helped to establish the relationship between features of interventions and the process and action of implementation that schools undertake, as indicated in the overarching research question two. However, the system map served as a thinking tool and helped inform subsequent WPs, rather than fully answer the overarching research questions.

¹ When we use the term 'schools' we are referring to education providers that serve pupils from 3–18 years old.



Figure 1: Work packages overview and relationships between them

Work Package 2

In Work Package 2 (WP2) we collected survey and interview data from people with leadership roles and responsibility for implementation in schools in England. Doing so allowed us to (a) capture views and experiences from school leaders about what implementation is like in practice, including barriers and enablers they recognise in their experiences, (b) find out about sources of information they use when planning and practicing implementation, including if and how they use the current EEF 'Putting Evidence to Work: A School's Guide to Implementation' guidance report and resources, (c) explore the system map by identifying factors that may have been missed, clarifying relationships between factors impacting implementation and recognising where the influence of some factors may differ according to context, and (d) gather feedback on how the current EEF implementation guidance report can be improved (specifically through a focus group with experienced users of the report).

This gave us important ideas about context that could be explored in the literature as part of WP4. While interview findings provide evidence for the premise that each context is unique, there are also regularities across contexts that support or hinder effective implementation and indications of mechanisms that may improve implementation and intervention outcomes. An example is how pre-designed interventions provide increased structure, training, and resources whilst approaches adapted to the school context provide increased fit and feasibility, autonomy, and buy-in. This shows how WP2 helped prime us when conducting WP4. WP2 also provided ideas about salient factors as we finalised the WP1 system map, such as consolidating factors that indicated the importance of motivation, communication, and funding.

WP2 sought to answer the following research questions:

- How do schools in England currently understand and experience implementation, and what barriers and enablers do they recognise? How does this relate to the system map derived from Work Package 1?
- How can the system map derived from Work Package 1 be refined and thickened in response to school practices?
- How is 'Putting Evidence to Work: A School's Guide to Implementation' currently being perceived, interpreted, applied, and adapted across the sector?

In doing so, it helped establish ideas for the overarching research question about school leaders understanding implementation as it directly collected data about this. Because surveys and interviews focused on an example of an approach being implemented it helped provide some evidence towards the second overarching research question about the relationship between what schools are implementing and how they do so. Sitting outside of the overarching research questions, the third WP2 research question was particularly valuable as it provided key implications to consider as the findings of this evidence review are translated into an updated guidance report for schools.

Work Package 3

Work Package 3 (WP3) identified empirical studies, or reviews of such studies, that either (a) look at the impact of factors that influence implementation in schools/education (drawing on the conceptualisation in WP1) or (b) seek to improve implementation in schools/education, and mapped (categorised) the review evidence so that we have an overview of what exists and where the gaps are in relation to particular types of intervention, factors that influence implementation, and implementation outcomes. This includes literature that evaluates whether using specific implementation strategies improve implementation in schools. The primary goal of WP3 was therefore to locate literature

of relevance for WP4 but also to transparently map reviews conducted to date and the literature that was used in WP4's synthesis. An evidence map of the empirical studies included in WP4 is therefore reported in WP3.

WP3 addressed the following research questions:

- What research literature exists that investigates how different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation), and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) pupil outcomes?
- What research literature exists that investigates the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?

As indicated in the wording of these questions, the purpose of this work package was to locate and categorise the literature to both help to answer what the evidence base tells us about the impact of implementation determinants and actions and strategies on outcomes in WP4.

Work Package 4

Work Package 4 (WP4) involved conducting a realist review. Realist reviews are used to understand how and why complex interventions achieve particular effects. They are a form of theory-driven research synthesis with origins in scientific realism that is concerned not only with whether an approach (i.e., intervention, policy, programme, or practice) is effective in improving intended outcomes but with how it works, for whom, in what conditions, and why. Central to this approach is the idea that interventions undertaken in complex systems, like schools, are underpinned in design and functioning by explicit or implicit theories comprising assumptions about ways effects occur. As an unimplemented or poorly implemented intervention is unlikely to produce its intended effects, theories of effectiveness need to extend to how and why interventions are successfully introduced, accepted, adopted, integrated, and embedded in existing teams, processes, and organisations—that is, implementation. As an example of what our realist review can evidence, we found during our ongoing synthesis that:

If a **context** in school *empowers* key staff to take professional development and cascade knowledge and resources to colleagues then underlying **mechanisms**—including *sharing* of knowledge and resources, considering intelligent *adaptations* for own school context, and *supporting* others with implementation—help improve **outcomes** such as *adoption* and *fidelity* in the short term and *pupil outcomes* in the longer term.

Alongside the realist synthesis that led to a programme theory depicting how evidence demonstrated key contexts and mechanisms relevant to outcomes, we assessed evidence for the impact of implementation strategies; after all, strategies like professional development, its format, resources, adapting an intervention, and collaboration are indicated in the example above. We therefore analysed how the programme theory evidence helps to show how and when strategies should be considered and who is involved in, or affected by, implementation strategies.

Previous work packages aided theory development and set the scope of the realist review. In realist reviews, theory is refined by searching for empirical research literature relevant to an initial programme theory. WP3 showed what relevant evidence was available. We also used literature retrieved in WP1 because it helped identifying contexts and mechanisms. As indicated above, WP1 with its system map, as well as WP2 findings with school leaders, helped to inform the initial programme theory that was refined through the synthesis in WP4.

WP4 answered the following questions:

- To what extent do different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation), and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) intervention outcomes?
- What is the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?

As is indicated, the links between contexts, mechanisms, and outcomes synthesised speaks directly to the first research question and the additional analysis indicated the impact of implementation strategies as well as how and when the strategies can be utilised.

WP4 also speaks directly to the overarching evidence review research questions:

- How should school leaders and teachers understand implementation and how should they implement evidence-informed approaches in their context to have the best chance of improving all pupils' outcomes?
- What is the relationship between content ('what') and process ('how') within school implementation?

It does this by providing a programme theory with evidence of impact on outcomes that indicates how to enact evidence-informed implementation. It also considers the relationship between what is implemented and how to implement this by revealing features of an intervention as one of the key contexts to be understood and appraised in implementation in education.

Our approach

We approached the evidence review with three guiding principles in mind. First, we took as read that schools are complex adaptive systems involving multiple participants. Understanding implementation in schools therefore needs to focus on context, barriers, and enablers as well as the specifics of the implementation process. Taking the view that schools are complex adaptive systems does not render implementation as unique to each school or something that cannot be planned. Instead, it implies a need to consider the resilience and adaptability of schools to system change and the components that help schools to practically sustain an approach after initial implementation efforts to establish the approach may have ended. These components include engagement and involvement of stakeholders, adaptability and flexibility to manage change, and formation of collaborative partnerships (Koh and Askell-Williams, 2021). This approach to understanding schools as complex systems recognises the interaction between various agents in the system (e.g. the DfE, school leaders, teachers, parents, pupils, and external collaborators) and creates feedback loops which inform decisions about continuation or discontinuation of ways of working (Murphy et al., 2018).

Second, we approached the work recognising the importance of context and the need to understand what works for whom, where, and why. This realist perspective is reflected in our staged approach to system map development (WP1), stakeholder consultation and system map iteration (WP2), evidence mapping (WP3), and theory generation and refinement drawing on realist evidence review work (WP4). Realist reviews are interested in developing and testing how *mechanisms* lead to *outcomes* in particular *contexts*. This contextually bound approach to causality is represented as context + mechanism = outcome. Mechanisms can be defined as ‘the underlying entities, processes or social structures that are triggered by an intervention being introduced impacting context’ (Astbury and Leeuw, 2010, p.368).

Given the wide range of strategies operating at different system levels to support evidence-informed decision-making and practice in schools, and the limited understanding of their mechanisms of action, the realist approach is particularly suited to the synthesis of evidence about implementation of interventions in schools. Schools also vary on a range of contextual factors that can make a difference to mechanisms of action, while different types of evidence-informed practice that schools may introduce also changes the context for implementation. The realist approach involves theory development and refinement, accounting for context as well as outcomes as it systematically and transparently synthesises literature to find out whether these theories are relevant and productive (Rycroft-Malone et al., 2012). We further consider whether the realist programme theory is relevant and productive by assessing how well it can explain how implementation strategies work, for which actors, in what situations, and why.

Realist reviews involve two broad stages: theory development and theory refinement (sometimes referred to as theory testing). Searches for literature and the use of systematically selected literature to support theory development or refinement happen separately in each stage. Theory development involves setting out a programme theory about how and why a complex intervention is thought to generate the outcome of interest. The applicability of the ideas within the programme theory are then refined using a range of relevant primary research evidence (not just quantitative effectiveness studies). It is during this ‘testing’ that ideas within the programme theory are refined in realist terms—specifying the contextual influences that are hypothesised to trigger relevant mechanisms to generate outcomes of interest. Stakeholder involvement is important in terms of developing theory applicable to practice and reviewing refined theory (Wong et al., 2013).

The third principle informing this evidence review was the use of an iterative approach involving a range of different stakeholders. This meant conceptual models could both inform, and be informed by, primary data collection with schools. It was also important that the evidence review engaged with stakeholders involved in implementation in schools, including the EEF guidance report panel formed to guide this evidence review. This was partly to maintain relevance to context and outcomes in practice but also because realist synthesis tends to have high stakeholder involvement. The panel comprises a range of practitioner and academic perspectives, including the Research Schools Network, school leadership, professional development across schools, implementation science, behaviour change, and school improvement. It provided input at key stages of the research, such as evidence sources and system map generation (for WP1), reviewing analysis of surveys and interviews (for WP2), commenting on draft evidence map (for WP3), and feedback on the early refined realist programme theory ahead of synthesis in relation to implementation strategies (for WP4).

Organisation of the report

The report is organised as follows. Chapters 2 to 5 report on the methods and findings from each of Work Packages 1 to 4. Finally, chapter 6 discusses the key messages, limitations, and links to other relevant literature from the evidence review as a whole.

Chapter 2. Work Package 1

WP1 focused on the conceptualisation of implementation in education. An iterative process was followed that involved a systematic review to locate and synthesise evidence about theories, models, and frameworks relevant to implementation in education. Close consultation with the EEF guidance report panel and discussion within the review team guided this work and in particular the system map as an output of the synthesis. We were interested in how existing conceptual work can help to explain the interaction between school context and implementation outcomes and what factors and dynamics amongst them might challenge or enable school implementation. Outputs from WP1 included:

- a system map depicting key factors involved in school implementation, including relationships between them; and
- a descriptive synthesis (tabulation and narrative) showing which theories, frameworks, and models have been applied to understanding implementation in schools in the reviewed literature.

This work helped to answer the following research questions.

How can existing implementation theories, models, and frameworks explain the interaction between school context and implementation outcomes?

How should we define and conceptualise school implementation?

It was important to consider how research literature defines implementation, whether implicit or explicitly stated, and where conceptualisations of implementation are indicated by a focus on aspects of implementation (like adoption, scaling up, and de-implementation).

Theories, models, and frameworks (TMFs) that explain implementation were located in the literature and we extracted and synthesised information about their application in research on implementation in schools as part of synthesis in the system map. This helped to identify factors and consider how school context affects implementation in schools.

It was important that the conceptualisation of implementation is of relevance to implementation practice in English schools. We therefore also consulted closely with the EEF guidance report panel throughout this conceptual work and at key points on:

- setting the initial scope for understanding school implementation—what existing frameworks need to be able to explain; priming of key factors involved in the process of school implementation to steer initial synthesis;
- input into search term development and grey literature sources to capture the most relevant literature;
- recommending key literature that may be included in the systematic review or will help to conceptualise implementation in relation to educational settings; and
- drafting and refining the system map according to key factors suggested by the panel that also appeared in the reviewed literature.

This close consultation with the guidance report panel took place through online meetings convened by EEF and email exchange. Two guidance report panel meetings took place in July and September 2021. The first focused on conceptualising implementation in schools and the second on factors relevant to implementation. Between these meetings, guidance report panel members suggested key literature sources of relevance to conceptualising implementation in schools (including grey literature).

We held five meetings with smaller groups from the guidance report panel between 19 October and 20 December 2021 to discuss the ongoing drafting of the system map. This was supplemented by email comments in relation to categorisation of factors for the system map and the organisation of the map.

WP1 systematic review methods

A systematic review was conducted that located and selected evidence that detailed theory, frameworks, models, sets of strategies, guidelines, and so forth, which are relevant to, or have been applied to, implementation in school settings. The systematic review followed the published protocol and, where relevant given the focus on synthesising theory, Campbell Collaboration MECCIR conduct and reporting standards for intervention reviews (The Methods Group of the Campbell Collaboration, 2017). We located frameworks reported in two types of studies. First, we searched for studies that describe or apply theories, models, and frameworks (TMFs) to education settings (3–18 years). This included a range of study designs, such as reviews of existing literature, discussion papers that present or adapt TMFs relevant to school implementation, empirical studies that apply an existing TMF to the implementation of an intervention in schools (and may evaluate this), papers that explore barriers and facilitators to school implementation in line with an existing TMF, and guidelines for school implementation that draw upon existing TMFs. Acknowledging that not all relevant implementation TMFs have been applied to school settings in research papers, we also searched for reviews reporting implementation TMFs where the review itself and the use of the TMFs were not necessarily school specific. This located implementation theory that is considered applicable across settings and may take different lenses: implementation

science, complexity science, behaviour change, knowledge mobilisation, and others. TMFs located through reviews beyond school settings were then searched for by name to see if these more generic TMFs had been applied in school-focused implementation literature.

The systematic review methods outlined below were chosen to allow us to (a) locate a wide range of TMFs, (b) benefit from independent reviewers to pinpoint relevance of theory and setting in a consistent way, (c) extract relevant data consistently, and (d) consider the strength of evidence when TMFs have been applied in school implementation research.

Inclusion and exclusion criteria for the review

Criteria to determine inclusion and exclusion decisions were refined after piloting title and abstract screening, with examples added then. We also produced decision-making flow diagrams that reviewers could use to aid screening decisions and therefore aid consistency in decision-making. Inclusion criteria are presented for the two different types of literature explained above, referred by the shorthand 'school implementation' and 'implementation reviews'.

i) School implementation criteria

Category	Criteria
Design	<i>Include</i> any study type (ranges from systematic review to discussion paper and practice guidelines).
Focus	<i>Include</i> papers that focus on implementation. This focus can be implementation of an intervention, broader, e.g. school improvement, or a narrower focus on a specific aspect of implementation, e.g. scaling up interventions or sustaining effects.
Theory, model, or framework	<i>Include</i> papers that clearly describe, assess, or apply theory, model, and/or framework/s relevant to implementation in education. TMF focused on school implementation or applied in schools. By TMF, we will include conceptualisation that categorises dimensions, barriers, factors, strategies, etc. relevant to school implementation. <i>Exclude</i> papers where the TMF focus is on intervention delivered rather than about implementation. For instance, guidelines or models and frameworks for education, like healthy school guidelines or teaching and learning models (pedagogy, curriculum) etc. <i>Exclude</i> studies describing TMFs that focus on only one factor or strategy relevant to school implementation, e.g. professional development models. <i>Exclude</i> models that categorise interventions, e.g. response to intervention or Positive Behaviour Support. <i>Exclude</i> implementation TMFs that are only relevant to a particular type of innovation, e.g. frameworks relevant only to implementing new technology, or school reforms in a particular time and place.
Setting	<i>Include</i> studies that focus on settings which are education institutions catering for 3- 18-year-olds. <i>Exclude</i> studies that focus only on higher education and 0–2 nursery phases (due to focus on education at compulsory ages in England). <i>Include</i> mainstream, independent, alternative, and specialist settings. <i>Exclude</i> very particular educational settings, like hospital schools or distance learning.
Implementation evaluation	<i>Exclude</i> studies which include description or assessment of how a single educational intervention was implemented or measure its implementation, unless applying an existing TMF to guide this. These studies will be relevant for Work Package 3; here we are focusing on how school implementation is conceptualised.
Language	<i>Include</i> papers written in English language only.

ii) Implementation reviews criteria

Category	Criteria
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Study design	<i>Include</i> reviews that have described how they searched for literature. Although most searches will be systematic and reproducible by different researchers, we will also include searches that might focus on index papers or snowball sampling, for instance when reviewers are starting from an existing group of TMFs.
Theory, model, or framework	<i>Include</i> reviews that focus upon TMFs explaining implementation. The overall aim of the review may be broader than locating frameworks or theory. Reviews may either focus on discussing the use of one TMF across studies or locate and synthesise a range of implementation TMFs.
Setting	<i>Include</i> implementation reviews that are not setting specific. <i>Exclude</i> implementation reviews focused on settings markedly different from educational settings. For example, a review that selects TMFs that are targeted to prevention or management of a disease not relevant to school health promotion would be excluded.
Language	Include papers written in English Language only.

Search strategy for identification of studies

We searched the education databases ERIC, Education Research Complete, British Education Index (via EBSCOhost), and the broader databases EMBASE, MEDLINE and PsycINFO (via OvidSp) and Social Science Citation Index (via Web of Science) between 15 and 19 July 2021. Scoping searches and previous experience of running searches for implementation studies indicated that these are the academic databases with relevant literature. We used terms relating to (1) implementation, (2) implementation outcomes (e.g. fidelity, adherence, and sustainability), and (3) TMFs (e.g. theory, model, framework). We also used terms for either (4) education 3–18 settings, to help locate school-focused studies across a range of study designs or (5) terms for reviews (e.g. systematic review, evidence synthesis). We conducted the two searches for *school implementation* papers and *implementation reviews* together within one overarching search, but we separated the literature retrieved for each *school implementation* (using term sets 1, 3, 4 above) and *implementation reviews* (using term sets 1–3, 5) nested search to perform separate study selection in line with the inclusion criteria above. Table 1 indicates how these two searches were organised. A search strategy as used for the database Psycinfo is in Appendix 1.

Table 1: Organisation of search for Work Package 1

School implementation search	Implementation reviews search
1. Implementation terms, e.g. Implementation in title Behaviour change in title or abstract Knowledge translation in title or abstract	2. Implementation outcome terms, e.g. Fidelity in title or abstract Adoption in title or abstract Acceptability in title or abstract
3. Theories, models, frameworks terms, e.g. Framework in title Guideline in title Taxonomy in title	
4. Education 3–18 setting terms, e.g. Teachers in title or abstract Classroom in title or abstract Kindergarten in title or abstract	5. Review terms, e.g. Systematic in title Evidence synthesis in title or abstract Scoping review in title or abstract

Additional searching was also conducted. This included handsearching journals that were identified as key to implementation in education and others frequently publishing included studies. This included *Advances in School Mental Health Promotion*, *BMC Health Services Research*, *BMC Public Health*, *Implementation Science*, *Journal of Educational and Psychological Consultation*, *Journal of Educational Administration*, *Prevention Science*, *Preventive Medicine*, and *Psychology in the Schools*. We anticipated that key reports and reviews may be in grey literature, so we searched separately for this, including using the search functions of twenty websites including Centre for Excellence and Development Impact and Learning; <https://evidencebased.education/>; Centre for evidence and implementation;

<https://cfirguide.org/>, Grattan Institute, What Works centres, including EEF. We also asked for recommendations from the guidance report panel and contacted key authors/theorists appearing across multiple included papers. These key authors included Aaron Lyon, Luke Wolfenden, Bianca Albers, Ross Brownson, Jennifer Leeman, Abraham Wandersman, and Susan Michie. See Appendix 2 for a list of journals and websites searched and authors contacted as part of this additional searching. Finally, given the initial database search did not use named TMFs in the search, we searched for TMFs that were located only in included implementations reviews not focused on school settings by name to locate any school-focused literature using these TMFs. This additional search was run from 7 to 12 October 2021 in the databases ERIC, Education Research Complete, British Education Index (via EBSCOhost) and PsycINFO (via OvidSp) given the focus on education papers in these databases. A search strategy for this additional search as used for the database Psycinfo is in Appendix 3. All search results were exported to EndNote software and de-duplicated for title and abstract screening. EndNote was used due to all the reviewers' (DM, CF, SBC, MR) familiarity with this software for screening. Additional finds from grey literature and author/expert recommendations were full text screened alongside full text screening of relevant database literature.

Selection of studies

Study selection involved separate stages of title and abstract screening and then full text screening in line with inclusion criteria as indicated above. All screening was completed by two independent reviewers (shared between DM, CF, SBC, MR), with any disagreements referred to a third reviewer (NA). All reviewers piloted the same set of title, abstract, and full text screening initially to align decisions and interpretation of inclusion criteria at the start of each screening stage. Inclusion criteria were refined to ensure clarity and consistency, this was typically by adding examples and constructing a flow diagram of study selection decisions. Results of this study selection process were documented using a PRISMA style flow chart, which is shown at the beginning of the Findings section.

Reviews that focused on TMFs in relation to school-based interventions are included as 'school implementation' studies, rather than amongst the implementation reviews. This was because data extraction criteria relevant to school settings were appropriate for these review studies.

Data extraction and management

Data extraction focused on details of both the included study and the TMFs featured in them. We extracted detail about: aim of study, implementation focus and definition, text and figures depicting TMFs, the context in which frameworks were used in the study, and any evidence relating to how the TMF is applied in school settings. For school-based studies we also extracted detail about study type, school setting, participants, and method. Hence reviews which took a school focus were included and extracted as 'school-based studies'. Some studies included multiple TMFs and details about each TMF were extracted. This was often the case for reviews that aimed to locate a range of TMFs. The same TMF was often seen across different studies; in this case, we still data extracted the same level of detail as this allowed for a fuller description of the TMFs that we synthesised later. The first ten papers extracted by each reviewer (SBC and CF) completing data extraction were checked by DM, with any changes shared and then applied to the remaining extraction. Data extraction was completed using Microsoft Excel. Separate extraction in relation to implementation factors was carried out as part of synthesis for the system map, as outlined below.

Appraisal of included studies

We briefly appraised the quality of included studies. As we aimed to include a wide range of reviews, we thought it would be important and useful to note the extent to which reviews are systematic and whether there is any evidence for the strength and relevance of a TMF that has been assessed in studies. For reviews and primary research, we assessed risk of bias and extracted data on whether reviews used quality assessments like GRADE. For included primary research we used the Mixed-methods Appraisal Tool (Hong et al., 2018) and for included reviews we used the CASP systematic review checklist, as this can be applied to systematic reviews that do not focus on intervention effectiveness. This appraisal was used only to report on study quality; it was not used to exclude studies, exclude the TMFs they reported on, or prioritise which TMFs were used in the synthesis we conducted.

Data synthesis

Reporting on the systematic review element of Work Package 1 involved descriptive synthesis (text and tables to provide an initial descriptive summary and explanation of the characteristics of the included studies; Centre for Reviews and Dissemination, 2009). We provide an overview of the included studies in line with data extraction and then present

findings organised in terms of the TMFs, rather than included study. For each TMF that appeared more than once across included reviews and studies we present:

- one clear representation of the TMF using figure and text as applicable;
- detail of how the framework was used in included studies;
- relevance to school implementation, including any evidence of its application and evaluation in school settings;
- the breadth of use of the TMF—whether it is relevant to any intervention or aspect of implementation; and
- detail about factors, barriers, and enablers and how context is accounted for in the TMF.

The above steps led to synthesis of a set of TMFs describing their content, use, and relevance to education. An overarching narrative synthesis (a configuring synthesis; Gough et al., 2012) indicates commonalities across TMFs.

While this synthesis of the TMFs located in literature is useful as an output, it fed the system map synthesis of WP1 too.

System mapping

Part of the synthesis undertaken in WP1 informed the development of a system map. This novel aspect of our research integrated systematic review findings with consultation with educational stakeholders and ongoing critical discourses amongst the cross-disciplinary review team.

System maps are theories of change that provide thinking tools which can be used for exploring complex interventions, including sense-checking suggested causal links as part of this (Smith and Hamer, 2019). ‘Systems mapping’ (the act of developing a system map) can be seen as a broad term capturing a variety of similar methods, including causal loop diagrams and theory of change maps (Barbrook-Johnson and Penn, 2021). A system map is made up of factors and their causal connections. Factors are variables that can increase or decrease in their amount or value, hence relationships between factors can be shown. Koorts et al. (2021) provide a relevant example of a system map focused on scaling up physical activity interventions.

System maps have been associated with complexity science as a field of study. A systems approach to complexity can help to frame interventions and the contexts in which they are used (Gates, 2016; Pfadenhauer et al., 2017). Indeed, there have been calls for more complexity-appropriate, or system-aware, theory of change models (Ling, 2012). However, a systems approach can also be seen to work well with behaviour change approaches (Vandenbroeck et al., 2007). Applying a systems approach to a problem can generate a richer understanding of the issues. Then, focusing in on behaviours with the contextual understanding of the causes and consequences of behaviour at a system level can be impactful, particularly when considering implementation (Best and Holmes, 2010). There are links between system mapping and our later realist theory generation, which is also interested in the contexts in which behavioural mechanisms for implementation operate.

Our system mapping drew out not only the key factors associated with school-based implementation but the relationships, interconnections, and interdependencies between them. Developing a system map, rather than only drawing upon one existing theory, model, or framework, enabled us to focus on what occurs during implementation in education specifically and to explore links between factors and implementation outcomes (Smith and Hamer, 2019). The factors within our system map can influence or be influenced by something else (often another factor). In relation to categories of TMFs, they are likely to show determinants of implementation practice. However, factors may indicate parts of the process or actors involved, while the dynamics between factors show processes and can indicate complexity-informed intervention points and where strategies are needed to support implementation (Kiekens et al., 2022). Rather than a linear theory of change depicting school implementation, the system map captures implementation as a dynamic process that includes relationships between activity, people, context, and outcomes across time and settings (Edwards-Groves et al., 2010; Roffey, 2012). The system map served as a thinking tool that captured a shared understanding and agreed labelling of important factors in implementation in education, recognition of the complexity of implementation in schools, categorisation and relationships between these factors, and an indication of where research evidence exists to support this.

System mapping is often participatory (Barbrook-Johnson and Penn, 2021). As our system mapping used both stakeholder input and literature included through the systematic review methods described above, here we set out the key steps taken to develop the system map.

Initially, a list of key factors was developed in response to stakeholder input and ongoing evidence synthesis. At the peak of this process over 100 factors appeared important. We refined this by focusing on factors present across multiple TMFs, evidenced as linked to either implementation outcomes or pupil outcomes or both, and also perceived as important by stakeholders. Often more than one factor was attributed to outcomes; this was of interest to us because this indicated where relationships or causal chains may be present in the implementation process. The list of key factors went through several iterations in response to stakeholder input and ongoing evidence synthesis.

Once the list of key factors was agreed we focused on synthesising included studies from the systematic review to ascertain relationships between factors and to add in additional factors that either causally impact, or are impacted by,

important factors. Relationships were recognised when they emerged through evidence synthesis, stakeholder consultation, and interview data. Relationships were also plotted during ongoing reflections and discussion among the research team and were prompted by questions including:

- What needs to occur for this factor to take place?
- What needs to happen and who needs to be involved for this factor to help or hinder implementation in schools?

This ongoing discussion was valuable in building consensus around the nature of interconnections, feedback loops, and other interactive characteristics of relationships.

We then began drafting the system map, initially using PowerPoint and then, given the scale of the map, using Kumu relationship mapping software. This is a platform designed for creating maps and other tools using systems thinking. It also helped us share drafts in real time across the research team and guidance report panel for feedback.

We met with guidance report panel members on several occasions as this synthesis developed, this helped to:

- achieve consensus on important factors associated with implementation, such as adding in scale-up and de-implementation to foundations associated with implementation in education, despite less research evidence than other factors;
- agreeing language choices, such as a focus on ‘support structures’ rather than ‘organisation and norms’; and
- feedback on drafts of the map, for instance helping position different categories of factors clearly with intervention-related characteristics in the centre and sustaining an intervention as an ongoing process rather than a final phase.

While present in, and supported by, research literature, the factors, relationships, and map structure are informed by stakeholders we engaged with and our own cross-disciplinary research team: the system map may have emphasised different relationships, wording, and emphasis on factors had we worked with a different group of stakeholders. For instance, some of the wording understandably fits with the existing EEF implementation guidance report.

By drawing upon existing implementation TMFs and insight from the EEF guidance report panel we were able to integrate practical examples of how factors interact across various school contexts with a range of evidence from multiple bodies of literature. WP2 used the system map to explore how factors and indicated relationships and feedback loops are reflected in current educational practices and different contexts. The system map also helped to inform the work for WP3 as it indicated key factors and processes to be identified and extracted as part of evidence mapping.

Findings

The findings of WP1 are organised according to systematic review findings that describe and synthesise the literature that was located as part of searches for each of ‘school implementation’ and ‘implementation reviews’ categories of literature. The latter part of the findings introduces and discusses the system map output from this work. The syntheses occurred in parallel and were iterative, given that the literature reviewed informed the system map.

Systematic review findings

Included studies

Details of included studies are presented separately for ‘school implementation’ and ‘implementation review’ categories because searches, screening, and data extraction were completed separately as indicated in the methods above.

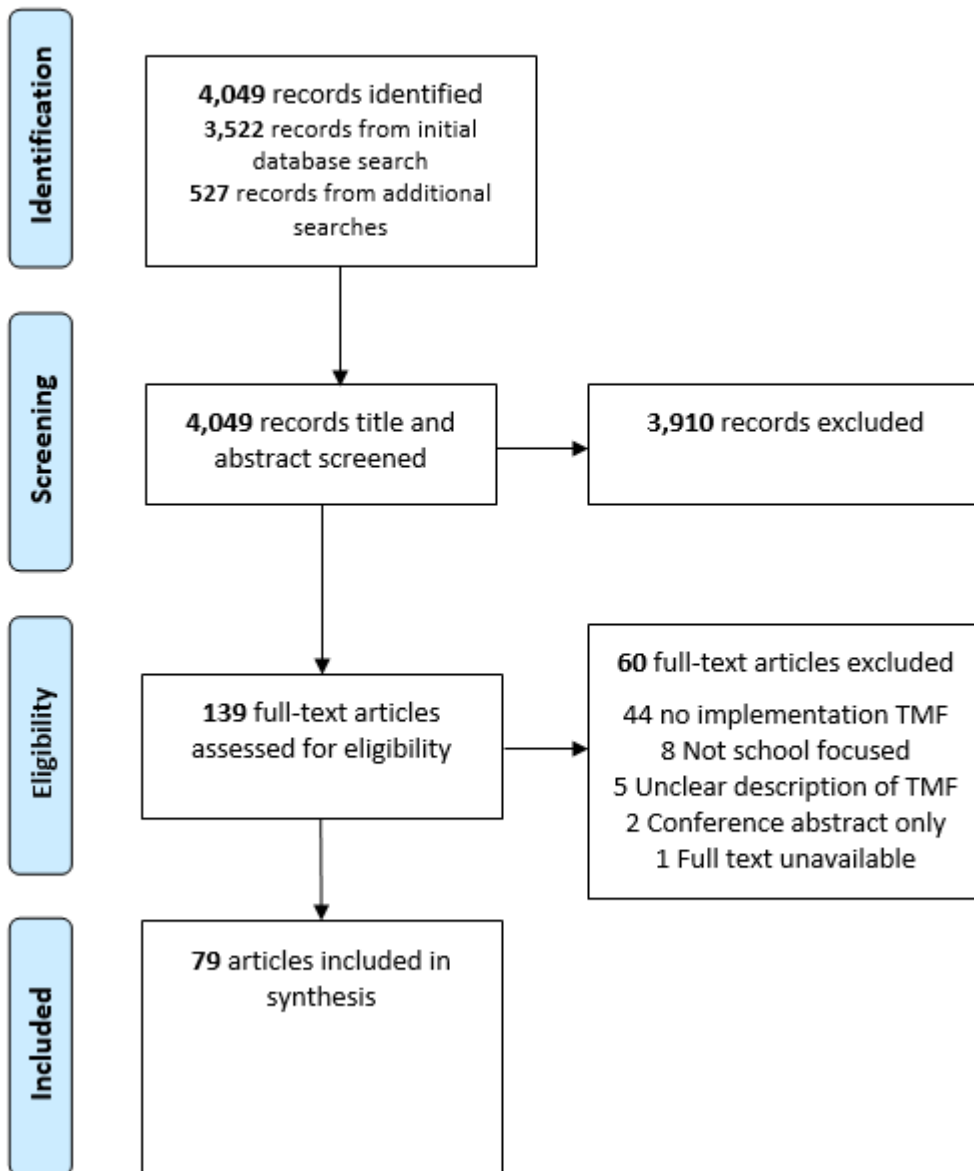
(i) School implementation—included studies

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram in Figure 1 summarises the process of study selection for school implementation studies. Initial database searching gave 3,522 records to title and abstract screen; 127 of these records were considered relevant and their full texts were retrieved and screened, leading to 73 included studies. A further six included studies were located through the additional searching, giving a total of 79. Most studies excluded at full text were either lacking a focus on a TMF, were not school focused, or had a limited description of a TMF. (See Appendix 4 for main study details.)

The 79 studies were often theoretical or discussion papers (n=30) presenting or discussing use of a TMF focused on implementation in schools; 17 included papers were reviews of empirical literature, typically systematic reviews. Included studies were often qualitative empirical research that used a TMF to guide data collection or analysis of views about an intervention (n=28); some of these were part of mixed-methods studies or process evaluations. Studies typically focused on implementation broadly, but some focused on specific aspects like sustaining implementation, scaling up, or de-implementation. The intervention focus was quite evenly spread between any school-based intervention and a particular type of intervention like mental health, policy change, or new subject curriculums. Studies were most frequently conducted in the U.S.A. (n=46). For empirical studies and reviews, school staff delivering the intervention were the most

frequent participant group. Most studies focused on the use of one TMF rather than multiple. Fourteen TMFs were seen across multiple studies.

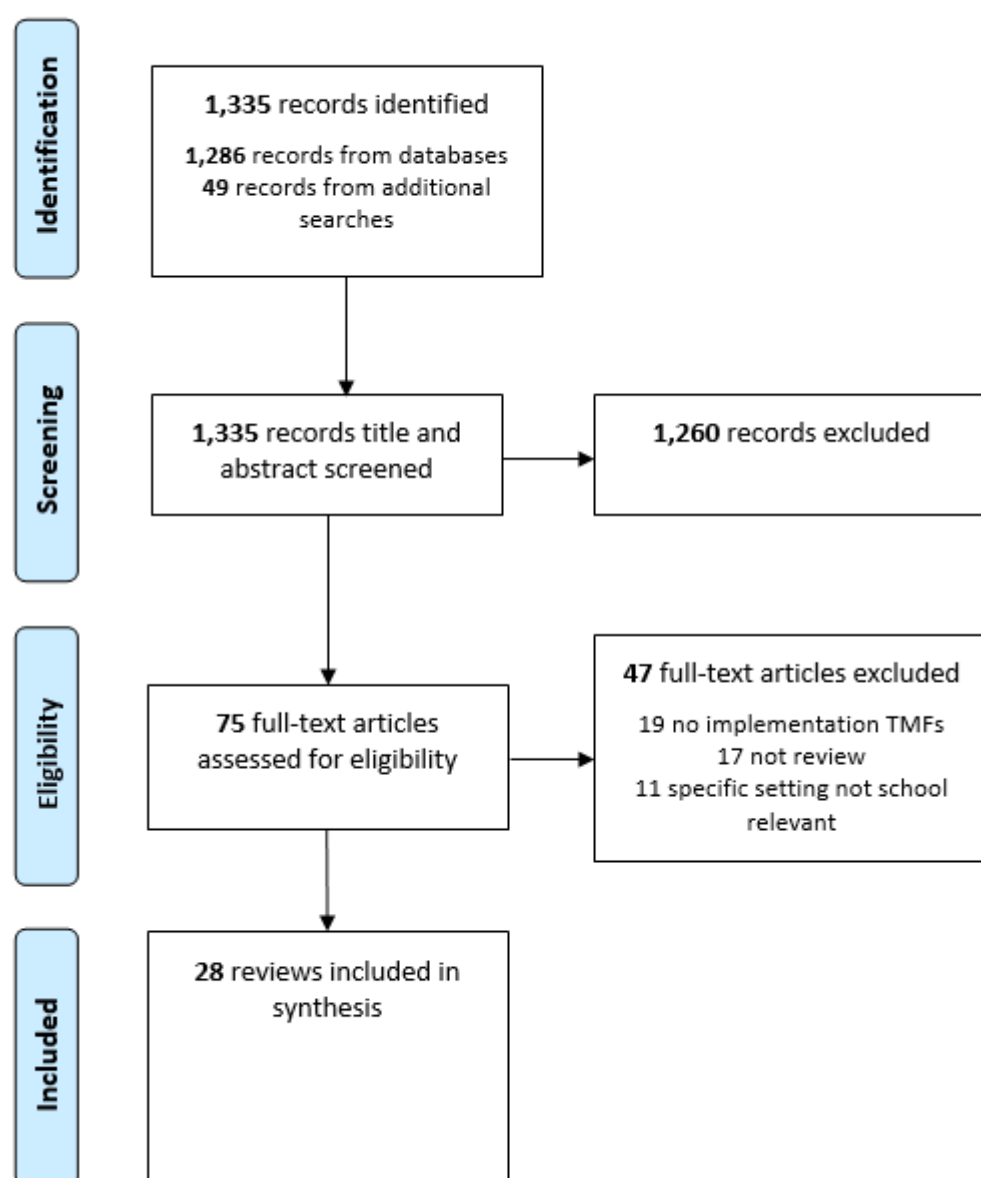
Figure 1. PRISMA flow diagram showing study selection process for Work Package 1 school implementation studies



(ii) Implementation reviews—included studies

The PRISMA diagram in Figure 2 summarises the process of study selection for implementation review studies.

Figure 2. PRISMA flow diagram showing study selection process for Work Package 1 implementation reviews



Initial database searching gave 1,286 records to title and abstract screen; 41 of these were considered relevant and their full texts were retrieved and screened leading to 18 included reviews. A further ten were located through the additional searching, giving a total of 28 included reviews. Most reviews excluded at full text were either not focused on implementation TMFs or were not reviews. Some were focused on implementation TMFs for a particular area of implementation not relevant to schools, most often clinical settings. (See Appendix 5 for main study details.)

The 28 reviews were often systematic reviews ($n=14$) or scoping reviews ($n=7$) and were either identifying the application of one TMF across multiple studies ($n=11$) or identifying a range of TMFs ($n=17$) relevant to a particular aspect of implementation or implementation of a particular intervention (that needed to be relevant to school settings). Eleven TMFs were seen across multiple studies, meaning that many TMFs only appeared in one review.

Quality appraisal

We assessed study quality using the CASP systematic review checklist for all reviews and Mixed-methods Appraisal Tool for empirical study. We did not appraise the quality of 30 included papers as these school-based papers were theoretical or discussion papers presenting or discussing the use of a TMF focused on implementation in schools. Quality appraisal ratings for each study are given in full in Appendix 6.

The CASP systematic review checklist applied to the 28 reviews that were not focused on school implementation showed that these always addressed a clearly focused question, searched for relevant papers, only combined results where reasonable to do so, and findings were clear and precise. We could not always tell if all the important, relevant

studies were included as often a systematic search across numerous databases was not used. Only 12 reviews assessed the quality of their included studies. We could not often tell whether all the important outcomes had been considered. Where reviews received these lower ratings, this was typically because not all claimed to be systematic reviews with comprehensive searches and performing quality appraisal. Indeed, some were scoping reviews.

The CASP systematic review checklist applied to the 17 reviews that were focused on school implementation showed that these always addressed a clearly focused question, only combined results where reasonable to do so, findings were clear and precise, and findings can be applied to school settings. We could not always tell if all the important, relevant studies were included as often a systematic search across numerous databases was not used. In a couple of reviews, we were unsure that the right type of papers were searched for. Only eight assessed quality of their included studies. We could not tell whether all the important outcomes had been considered. Where reviews received these lower ratings, this was typically because these did not claim to be systematic reviews with comprehensive searches and performing quality appraisal. Indeed, some were literature reviews rather than systematic reviews.

The MMAT applied to the 32 empirical studies in WP1 considered the different study designs separately. The qualitative approach and data collection methods were nearly always appropriate and coherent for those 27 studies that included a qualitative component. Although most studies presented no concerns ($n=19$), we could not always tell if findings were adequately drawn from data or the interpretation sufficiently substantiated by data. In the six non-randomised studies, measures were appropriate but we could not always tell if outcome data was complete or the intervention administered as intended. There was more risk of bias in relation to the representativeness of the sample and accounting for confounders in analysis. Quantitative descriptive studies were often sound in relation to sampling measurements used and analysis. Some studies held risk of bias in relation to the representativeness of the sample and risk of non-response bias. Mixed-methods studies tended to be clear of signs of bias, although we were not always clear that both the quantitative and qualitative component adhered to their respective quality criteria.

Overall, there were concerns in relation to a number of the included review's searches, quality appraisal of included studies, and outcomes considered. By comparison, most empirical studies were of good quality. As mentioned previously, we did not use this quality appraisal to exclude papers or TMFs but did consider it when using the evidence to identify relationships in the system map synthesis.

Synthesis of theories, models, and frameworks located in the systematic review

Our descriptive synthesis then moved on to focus on the TMFs that appeared across more than one included school implementation study or implementation review. There were 14 such TMFs: the majority (ten) appeared in both reviews and school implementation studies. Three appeared across school implementation studies only (CBAM, AIF, CMSBI) and the Promoting Action on Research Implementation in Health Services (PARIHS) determinant framework appeared in seven reviews, but not in research on school settings.

Appendix 7 gives further detail about each of these TMFs including their category, description, a summary of the included studies featuring the TMF, and evidence for how the TMF had been applied to understand implementation in schools. Below, we outline the existing TMFs that have frequently been applied in included papers. Therefore, implementation factors recognised in them and evidenced as impacting implementation in school will also be considered in the further system map synthesis.

The TMF most frequently appearing was the Consolidated Framework for Implementation Research (CFIR), an implementation science determinant framework. The reviews and studies using CFIR focus on the broad implementation system involving people, contexts, and innovations is one of only two determinant frameworks that were applied to schools, the other being National Implementation Research Network (NIRN model) (Fixsen et al. 2005; 2009; 2010). It appeared in nine implementation reviews and was applied in eight school implementation papers. The CFIR has recently been updated (Damschroder et al., 2022), therefore all the papers referred to the 2009 version. The CFIR provides a range of implementation constructs that are arranged across five domains: (1) INNOVATION (includes eight constructs), (2) OUTER SETTING (includes seven constructs), (3) INNER SETTING (includes eleven constructs), (4) INDIVIDUALS (includes nine constructs and a subdomain about roles based on COM-B), and (5) PROCESS (nine constructs).

Like the majority of TMFs (12 of 14), CFIR originates from the field of implementation science. In contrast, Diffusion of Innovations (DI) influenced implementation science 'through Rogers' work on the spread of innovations' (Nilsen et al., 2015, p7) and the Concerns Based Acceptance Model (CBAM) is a process of change originating in education. CFIR is not a school-focused TMF: the three located in literature were Promoting School/Community - University Partnerships to Enhance Resilience (PROSPER), Concerns Based Acceptance Model (CBAM), and Conceptual Model of School-Based Implementation (CMSBI).

Systematic reviews that included the CFIR looked at different applications of it (e.g. scale-up, factors influencing implementation of interventions, knowledge translation in clinical settings, constructs for public health and community settings), most often alongside other TMFs. The school papers more often focused on CFIR as a tool to guide evaluation and/or analysis of barriers and facilitators. Therefore, CFIR was typically used as a tool for understanding implementation rather than assessing the TMF's relevance to implementation in school practice—although it did help to

develop more specific frameworks in relation to school diabetes care (An et al., 2022) and a race-conscious framework (Allen et al., 2021).

Diffusion of Innovations (DI) is a classic theory that originated in communication studies to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. This TMF was as likely to be applied to school implementation studies (n=5) or appear in broader reviews (n=5). The nature of this TMF means the focus was typically on adoption, scaling up, and sustaining implementation. Again, school implementation studies tended to use this TMF to help to frame implementation rather than provide evidence about how applicable the TMF was.

Exploration Preparation Implementation and Sustainment (EPIS) is an implementation science TMF that considers both determinants and process. It is the sole TMF to be developed specifically for public mental health and social service settings. It divides the dissemination and implementation process into the following four phases: (1) Exploration, (2) Preparation, (3) Implementation, and (4) Sustainment. This TMF was more often seen in reviews, including one that systematically reviewed its use in studies (Moullin et al., 2019). Two school papers draw upon the EPIS framework, including the EEF (2019) guidance report. One school paper provided more evidence for use of the EPIS framework: Goldstein et al. (2015) indicate that using the EPIS TMF may have increased the effectiveness of an early literacy curriculum at the level of outer context (organisational networks) and at the inner context level (individual teacher characteristics).

The Expert Recommendations for Implementing Change (ERIC) is a compilation of implementation strategy terms and definitions. It has a broad focus in terms of types of implementation like CFIR, DI, NIRN, Interactive Systems Framework for Dissemination and Implementation (ISF), Normalization Process Theory (NPT) and the Active Implementation Frameworks (AIF). However, its focus is on implementation support rather than the explaining the implementation process. One review explored how ERIC strategies were used by implementation support practitioners (Albers et al., 2021). Cook et al. (2019) adapted and refined ERIC to produce a new taxonomy for the education sector (School Implementation Strategies, Translating ERIC Resources – SISTER). Lyon et al. (2019) then assessed the relevance and importance of these strategies for school mental health practitioners. Although this was not assessing the application of ERIC for school-based implementation, this represents a further framework focused on school.

Fixsen et al. (2005) present the NIRN determinant framework based on a review of implementation in a range of service domains including education, mental health, juvenile justice, and child welfare. It identifies six essential stages in implementation: exploration, installation, initial implementation, full implementation, innovation, and sustainability. Stages do not progress linearly but interact with each other throughout. Three reviews included this TMF in their work (Leeman et al., 2017; Meyers et al., 2012; Nilsen et al., 2019). Meyers et al. (2012) included this model in their synthesis of literature to develop the Quality Implementation Framework. While Fixsen et al.'s model has been applied to school settings (Odom et al. (2014) there was a lack of empirical research applying the TMF directly to school-based implementation. Odom et al. (2014) used this TMF and two others to describe the implementation of a programme for high school students with autism. The Active Implementation Framework is related to this TMF and appeared in two school implementation studies (Ryan Jackson et al, 2018; Sims et al., 2017). The AIF consists of five core components: (1) a usable innovation, (2) implementation drivers, (3) implementation stages, (4) improvement cycles, and (5) implementation teams.

The Getting to Outcomes (GTO) process model was developed to support practitioners, reach intended outcomes, and navigate accountability demands through processes of planning, implementation, and evaluation (Wandersman et al., 2000). GTO is focused on structural factors rather than the intervention. The approach has proven to have some success in some settings, particularly by providing a structure which can support and enable practitioners to establish data-based decision-making, however, there is limited evidence of how the process may help to facilitate or support sustainable longer term implementation outcomes (Chinman et al., 2008). It was located in two reviews (Albers et al., 2017; Meyers et al., 2012) and one school discussion paper (Splett et al., 2011).

The Interactive Systems Framework for Dissemination and Implementation (ISF) integrates aspects from research to practice models and community-centred models to support and examine how implementation works. The model is unique within the 14 TMFs due to its focus on prevention, seeing prevention not only through the lens of those using it and their own needs and perspectives but also as a way to understand better the needs of other stakeholders and systems (Wandersman et al., 2008). It provides a useful heuristic for understanding the complex needs, barriers, and resources of different systems, as well as a structure for engaging with existing research which can help to identify priority areas for new research (Wandersman et al., 2008). Four reviews cited this TMF (Albers et al., 2017; Leeman et al., 2017; Meyers et al., 2012; Skolarus et al., 2017), with one showing some evidence of the application of the model in school settings (Albers et al., 2017). Two school papers included ISF and provided evidence of its application to school-based implementation (Flaspohler et al., 2008; Leeman et al., 2018).

Normalization Process Theory (NPT) identifies four main determinants involved in embedding complex interventions into everyday practice. These determinants encompass diverse elements ranging from coherence, cognitive engagement, collective action, and reflexive monitoring (May et al., 2009). The theory also describes the potentially important role that the interactions and relationships between determinants play in shaping behaviour change and how

this can ebb and flow in a non-linear manner over time (May et al., 2011). NPT appeared in four reviews (Leeman et al., 2017; Nilsen, 2015; Skolarus et al., 2017; Tabak et al., 2012). Three school-based papers applied NPT to implementation (Chambers et al., 2020; Frigge et al., 2019; Woods et al., 2017), each supporting the relevance of NPT; two of these were school meal programmes. Chambers et al. (2020) state that NPT offers a useful framework for examining how educational policies and interventions are implemented but would also be useful in identifying barriers prior to implementation.

The PROSPER model conceptualises implementation in the school setting and guides capacity-building through aiming to outline the links between agents, infrastructure, and communities in building and maintaining capacity for implementation (Spoth et al., 2004). As stated above, this is one of three TMFs that is focused exclusively on schools. Meyers et al.'s (2012) review drew on this TMF, amongst others. PROSPER has been applied to process evaluation of implementation in the school context; although limited, this evidence suggests that PROSPER helped to structure the evaluation in ways helpful to ongoing decision-making (Nordstrum et al., 2017).

Similarly, the RE-AIM evaluation framework provides another guide which can be applied to the evaluation of interventions (Glasgow et al., 1999). With a focus on public health interventions, RE-AIM captures five key interacting dimensions of implementation: reach, efficacy, adoption, implementation (practice and process), and maintenance. Four reviews located RE-AIM in their search for TMFs (Esmail et al., 2020; Nilsen, 2015; Skolarus et al., 2017; Tabak et al., 2012). Four reviews that included school-based implementation evidenced use of RE-AIM (Cassar et al., 2019; Kennedy et al., 2020; McGoey et al., 2017; Sanchez-Flack et al., 2020). Two empirical papers also show the application of RE-AIM to school physical activity and public health interventions (Austin et al., 2011; Merrell, 2006).

CBAM was used by seven school implementation studies (Fenton, 2002; Gabby et al., 2017; Hall, 2013; Hollingshead, 2009; Roach et al., 2009; Trapani and Annunziato, 2018; Tunks, 2009). It did not appear in reviews broader than school settings. CBAM has three main constructs for assessing and guiding effective implementation of a new programme in schools: (1) Stages of Concern (SoC), addresses the concerns of the people charged with implementing it, (2) Innovation Configuration Map (IC Map), where school leaders' work with staff to develop a unique set of expected actions and behaviours for each person or role involved in a program, and (3) Levels of Use (LoU) is series of questions that a facilitator asks a staff member and enables educators to know the extent to which staff are using a new programme and if they are at the beginning stage or at a more advanced level. Three studies indicated that the model may have helped assess goals, attitudes, and behaviour around an intervention (Fenton, 2002; Gabby et al., 2017; Hollingshead, 2009). This indicates it tends to be the stages of concern that are most often applied from this TMF.

Active Implementation Frameworks (AIF) are an evidence-based set of frameworks developed following a systematic review and synthesis of the implementation evaluation literature. The AIFs consist of five core components: (1) a Usable Innovation, (2) Implementation Drivers, (3) Implementation Stages, (4) Improvement Cycles, and (5) Implementation Teams (Blanchard et al., 2017). Just two papers were included from our review. Ryan Jackson et al. (2018) present four domains for rapid school improvement describing how to use these improvement domains in practice and includes AIF and other frameworks. Sims et al. (2017) presents information to help educators and mental health professionals become familiar with AIFs and their importance to implementing effective mental health programmes in rural educational settings.

CMSBI was used in two school implementation studies (Cassar et al., 2019; Corboy et al., 2007). This evaluation framework is the only TMF focusing on implementation quality. It assumes implementation quality is based on the discrepancy between the intervention as planned and the intervention as delivered, and the discrepancy between the implementation support as planned and the implementation support as delivered. Corboy et al. (2007) indicated that the model helped to identify aspects of the implementation process that did not proceed as planned when implementing a mental health service in Primary Schools.

Finally, the Promoting Action on Research Implementation in Health Services (PARIHS) is a determinant framework that reflects the relationship between context, complexity, and process when an evidence-based intervention is introduced. This TMF was included in seven reviews that sought to locate a range of TMFs but no papers focused on school implementation (Bergstrom et al., 2020; Dryden-Palmer et al., 2020; Leeman et al., 2017; Meyers et al., 2012; Nilsen et al., 2019; Tabak et al., 2012; Watson et al., 2018). No evidence for application to school implementation was found.

The above 14 TMFs appeared across multiple studies; together they indicate a range of implementation factors that cover aspects of implementation including processes of using research evidence to inform practice, different ecological system levels (e.g. staff characteristics, school structures, external policies, funding), different phases of implementation, psychological and social processes, implementation strategies, and barriers to implementation. The following TMFs, EPIS, ERIC, GTO, ISF, PROSPER, CBAM and CMSBI, were not included in the Nilson et al. (2019) review. Evidence of application to school implementation was seen most often for CFIR, with six papers, NPT and RE-AIM, both with four, and ISF and CBAM, both with three. No evidence of application in school-based implementation was located for NIRM, GTO, AIF and PARIHS. However, compared to the volume of primary research identifying implementation factors in specific school intervention contexts located in Work Packages 3 and 4, only a minority of school implementation research uses existing TMFs as either a starting point, framework for analysis, or explanation of

implementation in education (79 studies and 13 TMFs used in multiple papers). Collectively, all TMFs provide a rich starting point for considering the evidence for how implementation factors relate to each other and to outcomes and, therefore, how we can think about implementation in schools as complex adaptive systems. Yet, there is a gap for further work that brings together the range of foci indicated across the TMFs applied to school to date and theorise the majority of school implementation research that does not draw upon existing TMFs.

System map synthesis

We synthesised the 79 included school-based empirical studies and reviews, extracting further information around the key factors of implementation addressed in the study that were associated with implementation and/or intervention outcomes. The synthesis of the evidence helped in the development of an initial list of key factors which appeared relevant to the implementation of evidence-informed practice across school contexts.

The research team and EEF guidance report panel members had ongoing discussions around the developing list of key factors to ensure they resonated with experience and expertise, and that theory translated to practice. At the peak of this process approximately 120 factors were generated through these discussions and sourcing from the included literature. The research team used guidance report panel feedback to integrate similar factors, sense-check language choice, and exclude factors which appeared less important in stakeholder experiences of implementation in schools.

A system map was developed to conceptualise the key factors and relationships between them which play a role in implementation.

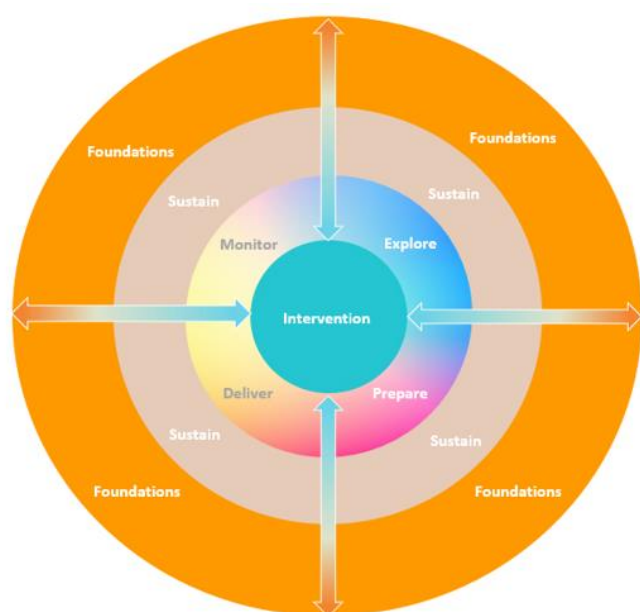
Overview

The system map provides a mid-range theory (expected to be applicable across different settings) that includes 101 factors important to school implementation and indicates causal relationships between them. The framework highlights key areas of implementation in schools: foundations, intervention-related factors, and implementation processes, which occur at distinct phases of implementation such as during initial exploring, preparation, delivery, monitoring, or sustainment phases.

The map includes components that determine the ways in which evidence-based practice gets put into practice in schools and how these components relate with each other. These components were developed through a process of synthesis, which integrated engaging with literature, stakeholder discussions, and consideration of implementation theories. The scope of the map's components includes:

- intervention characteristics—features of the intervention that improve outcomes like research evidence, feasibility, quality, and attitudes towards it;
- foundations for school implementation—underlying factors like leadership, resources, and focus on evidence-informed practice (often contextual) thought to influence implementation strategies; and
- implementation processes:
 - *explore*—strategies/factors most strongly associated with initial stages of implementation, including school improvement needs and assessment of the intervention;
 - *prepare*—strategies/factors most strongly associated with preparing to implement a chosen intervention, such as professional development and responsibilities;
 - *deliver*—strategies/factors most strongly associated with putting an implementation plan into action, such as ongoing support and evaluation and incentives;
 - *monitor*—strategies/factors most strongly associated with monitoring, evaluating, and using data to assess impacts of the intervention and its implementation; and
 - *sustain*—strategies/factors most strongly associated with sustaining an intervention over time. This includes decisions to de-implement ineffective practice and scale up effective practice.

Our synthesis, however, does not suggest that these phases are reliably sequential or predictably linear; we suggest that many often cross-cut stages as well as systems within a school. For example, we propose that 'readiness', which is often conceptualised as occurring primarily during exploring and preparing stages, often occurs iteratively throughout all stages of implementation and that it may be helpful to consider readiness to be an evolving element of implementation that may lessen or strengthen depending on influencing factors. That being the case, it may be valuable for implementation teams to facilitate inquiries into readiness and what this may mean for practice at opportune times across all phases of the implementation journey. The final system map can be viewed at: <https://kumu.io/RachelProctor/system-map-representing-the-factors-and-processes-which-determine-school-based-implementation-of-evidenced-based-practice-881f>. Figure 3 shows a heuristic overview of the system map without any detail of individual factors or relationships. Fundamentally, the system map helps to visualise and begin to explain how many implementation processes cut across stages or timeframes according to contextual factors, the nature of the intervention, and the characteristics of individuals or groups involved.



System Map- Factors and processes associated with school-based implementation

Figure 3: Heuristic overview of system map

Content, structure, and positioning

The map consists of three interactive systems levels. The outermost levels are where the foundational factors of school implementation are positioned. These foundational factors represent the underlying catalysts (often contextual) and instrumental elements thought to influence the take-up and application of implementation strategies. The foundations of implementation appear to strongly influence the practice and processes involved in implementation and therefore require attention in the design, delivery, and ongoing evaluation of school-based implementation.

The central level of the map is where factors most associated with an intervention or approach are positioned. These factors capture characteristics of an evidence-based approach that are highly dependent on the nature of a specific intervention. We drew a distinction between the intervention characteristics positioned in this central level and the processes or strategies associated with putting an evidence-based approach into practice which are positioned in the centre layers of the map.

The level of the system located between foundations and intervention characteristics are where most implementation processes are positioned. These processes, although loosely attributed to common phases of implementation such as explore, plan, deliver, monitor, or sustainment (Moullin et al., 2019), are dynamic in nature and examples across evidence and stakeholder consultation described experiences where processes were undertaken non-sequentially, iteratively, or both. In other words, the map facilitates a view of school implementation as an interactive system of inquiry rather than a road map from A to B. This was prominent in stakeholder experiences of working with schools to implement change, where depending on the type of context, individual characteristics, and wider networks it was prudent to take a selective and critical approach to selecting implementation strategies.

Between the outer foundations layer and the processes amongst explore, prepare, deliver, and monitor phases are implementation processes which most resonated with sustaining an approach over time. We positioned these factors at a distinct level to reflect two key findings. First, to reflect the prominence of sustaining momentum as a challenge considered throughout in stakeholder experiences and, second, to reflect the ways that evidence suggested sustainment of an approach was believed to influence or be influenced by decisions made in processes of implementation (Trapani and Annunziato, 2018; Koh and Askell-Williams, 2021). Although, this varied according to the type of decision and who was involved; a key message, which resonated across experiences and evidence, was the importance of slowing down and becoming more critical, purposeful, and clear in what an approach was aiming to achieve. Considering how a successful approach will be sustained over time is particularly important as change in schools has been found to be particularly difficult to sustain due to reasons including limited resource availability and competing priorities (An et al., 2021; Flaspohler et al., 2012).

How the map fed into subsequent work packages

The system map informed subsequent work packages in several ways. It informed the survey design and framework analysis approach to analysis undertaken in WP2's interview study with school leaders; it also informed development of the initial programme theory which underpinned the realist review in WP4. Key factors represented across the interacting systems of the map were re-contextualised (Hordern, 2021; Schriewer, 2017) into ten key domains of school implementation to provide a practical scope for analysis as part of the WP4 review work:

- leadership;
- climate;
- implementation planning and readiness;
- data monitoring;
- roles and teams;
- professional development and support;
- communication;
- de-implementation and scaling up;
- intervention evidence and resources; and
- intervention fit and feasibility.

Implications

The map captures the breadth of relationships between factors; it is evident, however, that a greater depth of understanding around how relationships work across contexts would help to generate practical insights into what this means for supporting schools. The depth of relationships between factors may be most effectively explored in practice by those implementing a change or new policy within their own context. Methods of system mapping, which could reflect the individuals, community, and living and working conditions within a specific school context, may provide a structure which supports critical reflection, develops professional relationships, and indicates what types of professional development and other support may be necessary, when and for whom. System mapping as a process of critical thinking may, therefore, play a role in supporting schools to explore and structure their own implementation inquiry by generating valuable insights from the process, but also from its output, which can provide holistic overview of connections and relationships that may facilitate or constrain progress.

The relationships plotted on the system map are indicated by evidence from the school-based implementation included studies from the systematic review. There is scope to indicate this evidence either as part of this map or as further analytical detail.

Culture and socioeconomic status are recognised as important contextual factors for school implementation (Wang and Lam, 2017; Mongon and Chapman, 2008) and frameworks exist for reducing disparities in implementation (Gaias et al., 2021). From a research perspective, considering how the current iteration of the map may be thickened for contexts or populations such as disadvantaged pupils are valuable areas for further development. The map's potential to enrich inquiry in school-based implementation is not limited to further empirical development: further dissemination processes would also ensure that the key messages of the map reach practitioners. This would help to communicate the nature of school-based implementation as complex systems of ongoing inquiry. It is also important that the messages of the map resonate and evolve. To ensure this, engaging meaningfully with school practitioners to explore and examine how the map may be best placed to help support schools is valuable. Through meaningful engagement with school-based practitioners, further research and dissemination ideas may be shaped and informed by those well placed to understand how it could be broken down and translated into tangible support, helpful tools, and supportive resources.

Limitations

The system map represents thinking at a certain time and considers evidence collated as part of a systematic review process. It is comprehensive but not exhaustive nor all-encompassing. It is a tool for structuring thinking around school implementation that is designed to facilitate discussion of how factors interconnect or relate and the implications of this for research, policy, and practice. In this sense, the map is a catalyst to spark discussion and debate rather than a representation of completeness. The positioning of factors on the map does not reflect the weight of evidence for a particular factor in the way an evidence map may attribute size or shape to volume or richness of evidence. The factors, relationships, and map structure are, however, uniquely reflective of how stakeholders across education, research, and policy experience school implementation and how these lived experiences correspond with evidence across theories, models, and frameworks.

The system map does not focus on types of implementation outcomes. This would complicate the map and is a more acute focus in Work Package 4. It should be noted that certain factors on the map might relate to particular implementation outcomes (e.g. adoption, fidelity, sustaining) and, as such, further work on the system map might indicate which factors are of particular relevance for certain outcomes. The system map served its purpose as a thinking tool to inform subsequent work packages and was engaged with by stakeholders and members of the research team. We recognise that for a more general audience who were not engaged with developmental steps there is going to be value in both simplifying the system map and indicating the evidence underpinning the factors and relationships.

Chapter 3. Work Package 2

Work Package 2 involved primary research with school leaders and feedback from users of the current EEF guidance report. Three phases of data collection and analysis were completed. Phase 1 involved surveys completed by school leaders or those with responsibility for an example of a new practice implemented in their school/s. Phase 2 interviewed some of the survey respondents to find out more detail about an example of implementation in their experience and factors that impacted this. Several of these school leaders were interviewed on two occasions to consider changes over time as schools are implementing a new practice. After semi-structured online interviews were completed, framework analysis was used to analyse this data. Phase 3 involved focus group feedback sessions with Research School Network members and people from other organisations that have used the current Putting Evidence into Practice: A Schools Guide to Implementation guidance report. Thematic analysis was used to present themes based on this feedback.

This helped answer the following research questions.

How do schools in England currently understand and experience implementation, and what barriers and enablers do they recognise? How does this relate to the system map derived from Work Package 1?

How can the system map derived from Work Package 1 be refined and thickened in response to school practices?

How is ‘Putting Evidence to Work: A School’s Guide to Implementation’ currently being perceived, interpreted, applied, and adapted across the sector?

Methods

Phase 1 surveys

Participants and sampling

A publicly available previous freedom of information request for school contact details in England (published on the 22 June 2021) was used to identify a sample of education providers for 3- to 18-year-olds. Schools were stratified into six phases (shown in Table 2). Within each phase, schools were stratified by their school type and three levels of deprivation (low, medium, or high). Within each strata we planned to contact 10% to participate. However, this was increased to 20% for 16+ phase providers and 30% for all other phase providers due to a low response rate. To include responses from trust chief executives we also selected a random sample of 200 multi-academy trusts and other trusts and federations in England and performed web searches to obtain chief executive names and email addresses. One participant contacted the research team to offer sharing the survey to a private Facebook group called ‘EYFS Early Adopter Schools 2020’. We agreed for the link to be shared here with the aim of increasing responses from the early years phase. The Facebook group has over 30,000 members at the time of writing. Later in data collection (January to February 2022), we also circulated the link to the survey through the EEF Research Schools Newsletter and Bristol City Council. The aim of this was to increase the diversity of approaches that surveys reported on as there were some approaches we were surprised not to have received any responses about. For example, Bristol City Council has partnered with the EEF and West Somerset Research School to deliver a project across the city aimed at developing effective leadership of teaching assistants. We also sought responses through the Research Schools Network newsletter in relation to assessment and feedback, subject areas beyond literacy and numeracy, metacognition and/or self-regulated learning, physical activity, and tuition. This targeted recruitment only led to four responses, therefore over 95% of responses were recruited through the stratified sampling. We distributed the same instructions and survey to all participants.

Table 2: Summary of survey sampling strategy

Phase	Types	Deprivation index used	% sampled
Nursery	Local authority nursery	Multiple deprivation	30%
Primary and middle deemed primary	Academy converter Academy sponsor led Community Foundation Free Voluntary aided Voluntary controlled	Total % of pupils eligible for the Deprivation Pupil Premium	30%
Secondary and middle	Academy converter Academy sponsor led Community Foundation	Total % of pupils eligible for the Deprivation Pupil Premium	30%

deemed secondary	Free Studio University Technical College Voluntary aided Grammar		
16+	Academy 16–19 sponsor led Academy 16–19 converter Academy converter Community Free schools 16–19, FE and Sixth form	Multiple Deprivation Decile	20% (higher response rate achieved)
All through	Academy converter Academy sponsor led Community Foundation Free Voluntary aided Voluntary controlled	Total % of pupils eligible for the Deprivation Pupil Premium	30%
Not applicable	Other independent Special Alternative	Multiple Deprivation Decile	30%

Materials

The survey included 32 main questions with some follow up questions relevant only to certain responses (e.g. about the make-up of a trust) and some optional questions (e.g. about examples of less successful implementation). It was divided into three sections:

- A. About you and your school—demographic questions about the respondent's role and their school.
- B. About a school improvement initiative that has been rolled out in your school in the last three academic years—questions on their role in this and that of other key colleagues; decision making, preparation, roll out, monitoring, embedding; school context, barriers and facilitators.
- C. About implementation generally—questions on how they define implementation, sources of support (including questions on EEF guidance report).

See Appendix 8 for a copy of the survey.

The survey asked respondents about examples of school improvement to capture understanding in relation to concrete experiences, framing the survey as primarily about school improvement, but pitching questions in relation to implementation factors and strategies. To avoid encouraging responses in line with the current EEF guidance report, we did not use the term 'implementation' throughout nor did we state that the survey is related to an update of the guidance report. Schools might have defined implementation according to the Ofsted Inspection Framework definition too. This approach has been used in other EEF-funded work on research use with a survey asking about an approach to support pupils' progress (Nelson et al., 2017).

Sections B and C of the survey included mostly quantitative, Likert-style questions with responses on a four-point scale of 'strongly disagree', 'disagree', 'agree', and 'strongly agree'. Some items were worded in terms of challenges (e.g. 'It has been hard to sustain the approach') so strongly agree responses were not always indicating positive outcomes. Each main set of Likert scale questions in part B included some short text open questions for 'other' factors and further information. Part B was organised around phases of implementation, barriers and enablers at different levels (e.g. intervention, people, inner/outer contexts), and school context informed by the synthesis of WP1 and the developing system map. The survey invited schools to share any relevant improvement or implementation plan and review documentation. The survey was piloted with several local school leaders and a draft survey was shared with the EEF for comments. Key to piloting was the length of the survey with some questions removed to keep the typical completion time to 15–20 minutes.

Procedure

An email explaining the study and with a link to the survey was sent, addressed to the headteacher by name, to the school's contact email. Emails were sent between November 2021 and March 2022. Three reminder emails were sent at roughly three-week intervals during term time to those who had not started the survey. The email indicated that the

survey could be completed by any colleague who had led a new approach in recent years at the headteacher's school. The initial sections of the survey included the study information sheet and collected informed consent from interested participants. The survey was closed on 10 April 2022.

Analysis

Analysis of survey responses included question-by-question descriptive statistics. We explored any differences in responses according to school phase, deprivation, and Ofsted rating. In part this was to check that it made good sense to collapse all responses rather than, for example, present primary school responses separate from secondary schools. Where we noted any different trends, we were tentative as these demographic differences relate to other intersectional differences like the type of approach schools answered about. Therefore, it was not meaningful to statistically test for difference between primary and secondary schools, deprivation levels, or Ofsted rating in isolation and the survey did not aim to be powered to assess differences across intersections like literacy + primary + higher deprivation versus others.

Ethics

Ethical approval for the survey and interviews was obtained from the School of Education research ethics committee at the University of Exeter, in line with British Education Research Association standards. Application ID W489803.

Phase 2 semi-structured interviews

Participants and sampling

The survey asked respondents whether they would like to receive information about participating in interviews and if they would like a summary of the survey findings. Fifteen respondents indicated interest in completing interviews and 41 requested a summary of the study's findings. We interviewed 12 schools, purposively sampled to maximise representativeness and to reach a level of saturation of data. Sampling considered the intervention focus (such as literacy, behaviour, curriculum, and school culture), job role (executive, assistant, headteacher, or other) as well as school phase, type, and deprivation level, as classified for the survey (please see Table 1 for a full list). We offered group interviews as an option to schools assuming several colleagues may be responsible for implementation or if the school felt this would enhance the interview.

Follow-up interviews were completed with four participants to learn about changes over time to their example of implementation, follow-up on important ideas from their first interview, and ask more general questions reflective of our research findings to date. We selected participants where we anticipated there may be some changes in an ongoing approach they had spoken about and where there was the opportunity to probe further on areas they had mentioned and were key in the analysis to date.

Materials

A topic guide was designed that indicated eleven areas to cover during the interview. This included the improvement need in their context, the approach, fit and readiness, preparation, leading the change, introducing the approach, monitoring and evaluation, broader impacts, context, implementation support, and de-implementation. These areas of interest were drawn from the system map and questions to find out more about the school context and the approach they had implemented. Although a generic topic guide was prepared, this was tailored for each interview on account of survey responses so that questions were specific to the approach the respondent answered about and any survey responses that were deemed interesting to explore (e.g. disagreement on certain factors other schools typically endorsed as relevant). See Appendix 9 for the topic guide. A separate topic guide was developed for the second-round interviews (see Appendix 10).

Procedure

Interviews were conducted by HG, RP, and SBC and took place between 29 November 2021 and 2 February 2022 using Zoom. Participants were contacted with the interview study information sheet (see Appendix 11) and asked to reply with available times if they decided they wished to participate. Participants received a study information sheet and consent form to complete pertaining to the interview phase of the study. This clarified details about recording the interview, anonymity and confidentiality, withdrawal, and storage of data. This was sent electronically in advance of interviews so participants had time to read the information and complete the consent form ahead of the interview time. In addition, researchers checked consent at the beginning of the interview and reminded participants of their right to withdraw.

Interviews were organised for up to an hour. Researchers encouraged participants to conduct the interview in a private room to reduce the chances of capturing video data of anyone who had not consented to participate. All interviews were conducted using Zoom. They were recorded and the audio files were transcribed using Otter.ai. Both apps used University of Exeter licenses and met GDPR standards. Researchers corrected the transcription and anonymised the transcript before deleting recordings.

The procedure for second-round interviews followed the same pattern. The same researcher conducted the second-round interview. Four interviews were completed between 8 April and 23 May 2022.

Analysis

Framework analysis was selected to analyse the data (Jessiman et al., 2019). Framework analysis provides a pragmatic approach which can balance breadth and depth of data, along with flexibility to best fit with the specific aims of a piece of research (Ritchie and Spencer, 2002). Framework analysis also emphasises how both research questions and emergent data-driven themes should guide the development of the analytic framework to be used.

The framework analysis included five main steps. Researchers familiarised themselves with data from interviews they conducted as part of transcription and summarised key findings from each interview. This helped when the researcher (HG) leading the analysis had not conducted the interviews. Secondly, interview data was coded using NVIVO software. This coding classified the data against the framework in line with the topic guide; key quotes were also noted. This allowed systematic comparison across interviews. Charting then occurred where key messages from each interview, along with key quotes, were added to the framework with rows corresponding to each interview and columns as topic guide areas. To develop a working analytical framework, we consolidated key themes running across phases of implementation as well as identifying more interpretive key messages, e.g. preparation as focused on purposeful planning and monitoring focused on differential use of data. This final stage interpreted data beyond description of what participants reported and instead explained actions and responses by actors and the school as a system. The write-up presents findings according to themes capturing these explanations.

Phase 3 focus groups

Methods

The final phase of WP2 involved online focus groups with experienced users of the EEF 'Putting Evidence to Work: A School's Guide to Implementation' guidance report and resources. Although the survey did ask questions about the guidance report and interviews considered support that participants drew upon, these feedback sessions were an opportunity to find out how those who used the guidance in practice viewed the report and resources and invite ideas for how to improve this.

Focus groups were held with members of the Research Schools Network recruited through the Research Schools newsletter. Three focus groups with fifteen Research School Network colleagues were held between 10 December 2021 and 10 January 2022. Focus groups were held online on Zoom; they were recorded with participants' permission so that transcripts could be generated to aid analysis. Sessions were scheduled to last up to 90 minutes, lasting 90 minutes with two groups of five or more attendees.

The focus groups centred around three main topics:

- What do you think is useful/less useful about the guidance report and resources?
- What do you find works well and/or is challenging to put into practice?
- Areas for improvement/where is there a need for further guidance?

We shared these topics to participants in advance. Two of the research team led each focus group (DM, RP, SBC). The conversation took a semi-structured approach as areas for improvement tended to be covered throughout. In introductions at the start, we collected useful data about the different ways that participants had used the report, often as a part of professional development with schools related to other interventions.

We also held focus groups with experienced users of the guidance report outside of research schools. We defined 'experienced users' as anyone who knows the guidance report well and has either delivered training on implementation or applied it in their work. The EEF provided contact details of known experienced users. This included organisations delivering professional development to schools, local authorities, and multi-academy trusts. Researchers contacted this list and the majority were interested in taking part.

Three focus groups were held with thirteen participants between 14 January and 1 February 2022. The format and structure were like the focus groups with Research Schools Network, except that the early part of these focus groups included a focus on how and why participants have used the guidance report and associated resources.

The focus group responses provided useful feedback and recommendations in relation to the guidance report update. It also helped us to learn more about how theory speaks to practice, particularly in relation to how ideas from the WP1 system map were represented in responses. We analysed responses using thematic analysis as there were commonalities across the focus groups, including between the different types of users.

Findings

Phase 1—survey

Demographics

One hundred and two surveys were completed: 68 were school leaders, 19 executive heads, ten deputy or assistant heads, three other senior leadership team, and two in other roles. Individuals had been in their current position for 0–1 years (n=16), 2–4 years (n=37), 5–9 years (n=26), 10–19 years (n=18), 20–29 years (n=4), and 30+ years (n=1); 82 worked in a single school and 20 across multiple schools.

Most respondents worked in a community (n=25), academy (n=22), or independent school (n=11); 63 different U.K. local authorities were represented. Table 2 shows which phase respondents worked in.

Table 1: Number of respondents working in each school phase (n=102)

Phase	Number of responses
Nursery	2
Primary (Including middle, deemed primary)	51
Further Education/Post-16	1
Secondary (Including middle, deemed secondary)	17
Other	11
Multiple schools	20

Two survey responses were completed regarding a nursery. The level of deprivation in the catchment area was described as 'very deprived' in one and 'deprived' in the other (options were 'very deprived', 'deprived', 'not very', 'not at all', or 'somewhat deprived'). One survey response was completed regarding an FE college. The level of deprivation in the catchment area was described as very high (options as above). Deprivation Pupil Premium was used as the measure of deprivation in primary and secondary schools: see Table 3 (primary) and Table 4 (secondary) for these results. There was a relatively even distribution of deprivation for primary schools and more lower levels of deprivation in secondary schools.

Table 3: Number of respondents reporting each level of deprivation Pupil Premium for their school working in primary (n = 102)

Range of deprivation Pupil Premium	Number of primary school pupils eligible
0–9%	10
10–19%	11
20–29%	10

30–49%	9
50 or over	11

Table 4: Number of respondents reporting each level of deprivation Pupil Premium for their school working in secondary (n = 102)

Range of deprivation pupil premium	Number of secondary school pupils eligible
1–9%	5
10–19%	3
20–39%	4
40–59%	3
60 or over	1
No range	1

Table 5: Number of respondents working in schools by Ofsted grade (n = 102)

Grade	Number
Inadequate	4
Requires Improvement	8
Good	48
Outstanding	13
Not relevant	9
Not completed	20

Identifying an improvement need and approach

The improvement needs identified were most often regarding the curriculum, including maths, phonics, English, (35 responses), behaviour (23 responses), teaching and learning (nine responses), and SEND provision (six responses). Other examples infrequently seen include use of technology, mental health, self-reflective practices of students, student voice, teaching assistants, and reintegration into mainstream school.

The approaches introduced to tackle the area of improvement can be summarised as structured programmes ('introduction of LEXIA reading programme from Y2-6', 'STAR behaviour system based on SLANT', 'DELTA project'), professional development ('attachment and trauma aware training', 'training on leadership for all teaching staff', 'use of G-suite/Google Classroom, introduced via staff training'), policies ('we have reviewed and slimmed down marking policy with a focus on in the moment marking', 'a new behaviour policy based on positive relationships and mutual respect between staff and students') and approaches based on culture, ethos, and philosophies ('restorative conversations/positive relationships, based around kindness, honesty and respect', 'regular reminders about expectations in assemblies and for staff to use the 'ready, respectful, safe' mantra when speaking with pupils, for consistency').

Table 6 shows the number of respondents that consulted different sources when identifying the school improvement need or deciding on an approach to introduce to the school. The school policy and vision, as well as colleagues within the school or trust, are the primary sources consulted at this stage (71 and 70 consulted these sources, respectively). Pupil attainment data was used to inform these decisions (60), more so than other pupil data (49). Academic research (54) and professional development (61) were also consulted by many respondents. Sources which were consulted less than may be expected were colleagues in other schools (36) and online evidence platforms or databases (39).

Table 6: Number of respondents that consulted different sources when identifying need or deciding on an approach (n = 101)

Answer	Number
School policy or vision	71
Colleagues within my own school or trust	70
Information gathered through professional development	61
Pupil attainment data	60
Articles, reports, books, or summaries based on academic research	54
Other pupil data	49
External organisations (e.g. local authority, subject associations, professional development providers, DfE, Ofsted)	44
Articles, reports, books, or summaries based on teacher experience	42
Consultation with a range of school stakeholders	41
Online evidence platforms or databases (e.g. Chartered College of Teaching, Education Endowment Foundation resources)	39
Colleagues in other schools	36
External policy	6
Guidance from exam boards	5

Schools were asked, 'Please think about when you or your school were identifying the improvement need and deciding what approach to introduce. How much do you agree with the following statements?' (Table 7). The statements which received 95% 'agree' or 'strongly agree' were, 'the change was agreed by staff as a key priority for school improvement' and 'we assessed how well the approach would fit our school and any changes that were needed to accommodate it'. This indicates that staff buy-in and intervention fit are key considerations for schools when identifying their improvement needs and possible approaches to introduce. Mixed responses were seen in relation to the statement, 'The approach was mandated (e.g. Ofsted, whole trust approach, practice introduced across authority/nationally).'

Table 7: Drivers influencing the identification of improvement need and adoption of a specific approach (n = 102)

#	Question	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
1	The change was agreed by staff as a key priority for school improvement	67	27	3	1	1

2	Evidence that the approach had positive outcomes in a similar context was important	56	35	4	0	4
3	It was important that the approach represented good value for money	45	40	7	1	6
4	We assessed how well the approach would fit our school and any changes that were needed to accommodate it	72	24	2	0	1
5	We explored different approaches to find the most feasible and promising one	43	43	11	1	1
6	We ensured that staff perceived the approach as a better option than established practice	64	28	4	0	3
7	It was important that external partners, parents and carers supported the approach	34	49	11	3	2
8	Research evidence supporting the approach was available and clear	42	39	12	1	5
9	The approach was mandated (e.g. Ofsted, whole trust approach, practice introduced across authority/nationally)	17	26	21	21	14

An open text optional question followed this for respondents to note anything else that stood out as particularly helpful or particularly challenging when determining which new approach to introduce. This open text question provided a rich insight into helpful and challenging factors and processes when determining which approach to introduce. Helpful factors included: low cost, simplicity (ease of use), the approach shows positive/high impact quickly, staff buy-in, masters training and professional development, consulting with experienced colleagues, adapting to context, getting the staffing right, and receiving support from intervention providers. Some of the challenges faced by schools included: treating the process as gradual, changing established routines and practices, adapting to context, unforeseen circumstances and changing student intakes, introducing change whilst in an interim leadership position, having staff against the pedagogy, and finding a scheme that suits their ability range.

Planning

Eighty-nine schools created a structured plan for introducing their approach and 13 did not. Schools were asked how much they agreed with a range of statements regarding planning and Table 8 shows there was typically less agreement to these compared to statements regarding the exploration of problems and solutions. Eighty agreed that 'planning was the responsibility of the senior leadership team', which indicates there may not have been substantial involvement from members in other roles within the school system. This is supported by the relatively low agreement with statement two (66 agreed or strongly agreed that 'students and parents were informed and prepared about the approach') and statement three (57 agreed or strongly agreed that 'we worked with external organisations—e.g. other schools, the developers of the approach, staff who support schools—to prepare for introducing the approach'). The response with the highest percentage for strong agreement was, 'The approach had a clear champion, who was responsible for planning, maintaining resources and overseeing the introduction of this change.' This resonates with literature which suggests champions are important for the introduction of a change, however literature is cautious about the sustainability of placing a large amount of responsibility and knowledge with one person. There was also strong agreement with effective training being received and necessary resources identified.

Table 8: Exploring planning and implementation of change (n = 99)

#	Question	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
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1	Planning was the responsibility of the senior leadership team	46	34	17	1	1
2	Students and parents were informed and prepared about the approach	24	42	22	3	8
3	We worked with external organisations (e.g. other schools, the developers of the approach, staff who support schools) to prepare for introducing the approach	27	30	25	7	10
4	The approach had a clear champion, who was responsible for planning, maintaining resources and overseeing the introduction of this change	65	25	5	1	3
5	Staff delivering the approach received effective training	60	34	2	1	2
6	Necessary resources including time, staff and funding were identified	61	32	4	0	2
7	We had to revise the plans for introducing the approach because of the impact of COVID-19	32	27	19	6	15

An open text optional question followed this for respondents to let us know anything that was particularly helpful or challenging when preparing for this new approach to be introduced in their school(s). Open text responses indicated various factors that were helpful when preparing for the approach to be introduced, including having the freedom to be creative and exercise professional judgement, COVID-19 as it provided external pressure to have high standards, training, extending responsibility to a wider team of staff members, SLT providing teachers time out of class to plan and practice, staff accountability, external expertise providing quality assurance and being non-judgemental, and the ability to adapt to context. Factors that were described as challenging when preparing for the approach to be introduced included phasing the approach, managing the diversity of opinion from both staff and parents, having teachers who are not entirely bought in to the new approach, supporting teachers who historically have a lack of training and are therefore under confident, communicating data, and managing the impact of COVID-19.

Delivery and initial introduction of the approach

Schools were asked how much they agree with a range of statements about when they first started to introduce the approach in practice. A low level of agreement was seen for the statement 'staff felt like they did not have enough time to prepare for and deliver the approach' suggesting that leaders felt they did allocate staff sufficient time. There was also a low level of agreement with 'we conducted a smaller pilot of the approach before introducing it more fully'. Statements 1 and 2 both received a very high level of agreement: 'staff felt trusted to try out the approach and make mistakes' and 'advice and support was available for staff as they started to deliver the approach' (see Table 9).

Table 9: When schools first started to introduce the approach in practice (n = 98)

#	Question	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
1	Staff felt trusted to try out the approach and make mistakes	53	41	0	0	3
2	Advice and support was available for staff as they started to deliver the approach	62	33	0	0	2
3	Staff adapted the approach to suit their subject/phase and pupils	39	37	10	3	7

4	We conducted a smaller pilot of the approach before introducing it more fully	30	23	21	14	9
5	Staff introducing the approach understood and valued its goals	55	40	1	0	1
6	Staff felt like they did not have enough time to prepare for and deliver the approach	12	14	44	23	3

An open text optional question asked about a feature of respondent's school context that stood out as particularly helpful or particularly challenging when introducing the approach into practice. The responses recorded a range of factors that were helpful. These included having a broad leadership structure, staff collaboration and buy-in, workload comparable to previous practice, and ensuring the approach was linked to vision and curriculum intent. Collaboration was a facilitator in both the small school context ('small school facilitates dialogue for training, trialling strategies') and in a MAT context ('culture being a collaborative one, the fact we had school improvement teams across the MAT who meet regularly and have a common or aligned approach to development'). Similarly, the small school context created challenging conditions ('small school—little teacher support, plan independently'). Several schools also noted challenges with parental engagement ('whilst our parents overall are generally supportive of school, they feel that education is just the school's job, and we know it needs to be a partnership').

Monitoring

Schools were asked how much they agree with a range of statements about monitoring and evaluating the impact of the approach. Overall, there was a low level of strong agreement with statements regarding monitoring. This seems to suggest that even though the vast majority of respondents agreed that the approach was successful in its aim there were challenges in monitoring impact and including data from different individuals. However, 91 respondents agreed or strongly agreed that 'staff were encouraged to feedback concerns that arose in practice' and 86 agreed or strongly agreed that 'the approach was successful in its aims'; 76 agreed or strongly agreed that 'staff knew what data to collect in order to monitor impact of the new approach', 'reflection, feedback and monitoring changed subsequent delivery of the approach' (n=74), and 'feedback from students and families was also used to evaluate the new approach' (n=68). Twenty-seven agreed or strongly agreed that 'it was difficult to monitor the effectiveness of the approach in practice'. See Table 10.

Table 10: Monitoring and evaluating the impact of the approach (n = 96)

#	Question	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
1	Staff knew what data to collect in order to monitor impact of the new approach	34	42	9	0	9
2	Feedback from students and families was also used to evaluate the new approach	22	46	16	3	8
3	It was difficult to monitor the effectiveness of the approach in practice	7	20	45	21	2
4	Reflection, feedback and monitoring changed subsequent delivery of the approach	22	52	10	4	7
5	Staff were encouraged to feedback concerns that arose in practice	48	43	1	0	2
6	The approach was successful in its aims	52	34	2	0	7

An open text optional question asked how participants measured the success of the approach, including any relevant measures regarding delivery as well as impact on pupils. Some respondents indicated that a range of measures were used to assess the impact of the approach at different stages of implementation, for example, through teacher feedback followed by observation, then considering costs. Changes to behaviour policy were measured in a range of ways including behaviour data, observations, and feedback from a wider range of the school community including visitors.

Some respondents indicated that they could not answer this question or begin to measure success due to the early phase of implementation. Surveys were also reported to gain, or engage with, the views of school members. For example, 'pupil and staff surveys were used to consider the new routine' and 'staff survey planning moderation and discussions on effectiveness and changes needed Teacher Meetings'. Finally, pupil outcomes were described such as 'book scrutinies, lesson observations', 'unannounced book audits', 'measure of average spelling scores against national averages and also age standardised scores and spelling ages', and 'benchmark assessments before and after each unit of study'.

A further open text optional question asked about a feature of the approach that stood out as particularly helpful or particularly challenging in efforts to monitor and evaluate its impact. Some of the features that were helpful include: organisational features of the school ('management structure across three schools to lessen the workload of staff'), reduced accountability factors ('because there was not a pressure to achieve a particular result, staff felt less pressurised and the children also saw it as more enjoyable'), staff ownership of data ('data was held by the entire staff team—so everyone had ownership over it, could see progress (or not), input data, and upload evidence—this meant it was completely transparent and people took it seriously'), and staff relationships ('it is all about relationships ensuring staff feel all in it together; senior leaders must be available and must listen').

Some of the features that were challenging in their efforts to monitor and evaluate impact were the speed of progress ('changing behaviour in school takes time and often the changes are small, meaning that staff in daily contact may not recognise the progress that has been made'), consistency ('not all staff were on board and some were erratic in their implementation of the new routines; this made monitoring haphazard at times as we did not have information from all classes'), finding a suitable measurement for outcomes of interest like school culture and staff turnover ('challenging for us is that staff miss CPD training due to illness or moving jobs; we then have to re-train new members of staff quickly').

Sustaining

All respondents except one were still using the approach at the time of completing the survey. As a result, there is no data regarding de-implementation. Schools were asked how much they agreed with a range of statements about sustaining the approach: 90 agreed that 'the approach has become part of usual practice at the school/s' and 88 agreed or strongly agreed that 'delivery of the approach is resilient to any new practice or demands that might occur'. Relatively fewer agreed or strongly agreed that 'the approach has been rolled out more widely than at first' (n=56), which may be consistent with the indication that not all schools piloted the approach before fully introducing it. Notably, 76 agreed or strongly agreed that 'over time the approach has been further adapted to our school context'. This indicates that while the approach is part of typical practice it may have changed over time. Just over a quarter of respondents reported that it had been difficult to sustain the approach too (see Table 11).

Table 11: Sustaining the approach (n = 96)

#	Question	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable
1	The approach has become part of usual practice at the school/s	58	32	1	0	1
2	Delivery of the approach is resilient to any new practice or demands that might occur	40	44	4	2	2
3	The approach has been rolled out more widely than at first	35	21	15	4	16
4	It has been hard to sustain the approach	4	20	42	24	2
5	Over time the approach has been further adapted to our school context	30	46	7	2	6
6	Support for staff delivering the approach has been necessary to continue	35	44	8	2	3

A follow-up open text optional question asked participants to tell us an important feature of their school context that stands out as particularly helpful or challenging in sustaining use of the approach. Features that were helpful for sustaining use of the approach included:

- external support and staff engagement—‘we have brought in a consultant/trained coach to work with staff teams and individuals, staff have engaged well and because the staff feel that they have learned new skills, have been told they are getting things right, they are eager to learn more; they use the word exciting!’, ‘teachers leading the approach has ensured a productive and effective dialogue’;
- accountability—‘external approval of approach (Ofsted)’; and
- reflection—‘also a culture of discussing what has been successful or not and reviewing approaches accordingly’.

Staff changes were a challenging factor for many schools in their efforts to sustain an approach (‘staff illness and a range of supply teachers has meant that classroom routines have lapsed since September and the consistency and coherence that was beginning to be established needs to be refreshed’, ‘changing staff means we have to ensure they know the processes and use them effectively’).

Participants were asked if there were any other approaches they have attempted to introduce in their school over recent years that have not been as successful or are no longer being used. Respondents mentioned reasons including approaches not being conducive to online learning during lockdowns, changing to less expensive approaches, lack of buy-in from staff and students, not fitting school context or pupils needs, adopting trust approaches, staff turnover, and lack of evidence of impact.

Implementation terms and support

Section C of the survey started by asking which aspects of implementation school leaders would value further guidance on in relation to introducing new approaches. Respondents could tick as many options as they liked. The highest level of agreement was for further guidance on ‘supporting staff to address and solve problems when delivering new approaches’ (n=48) and ‘embedding a school culture that supports improvement’ (n=47). All other statements had below 50% agreement. Schools indicated the least need for guidance on ‘identifying and agreeing with your school community a key priority that is amenable to change’ (n=22) and ‘selecting strategies that support introducing new approaches’ (n=19). Please see Table 12 below for a full list of statements.

Table 12: Areas where further guidance around implementation is valued (n = 84)

Further support item	Number
Supporting staff to address and solve problems when delivering new approaches	48
Embedding a school culture that supports improvement	47
Planning for sustaining the approach from the outset	36
Assessing the readiness of the school and individuals to deliver new approaches	36
Developing relationships with academic and wider networks who can provide support? (e.g. funding and training opportunities)	36
Developing a clear, logical and well specified plan for introduction and delivery of new approaches	33
Communicating the rationale and key details of new approaches to all those impacted (staff, pupils, families, other stakeholders)	33
Identifying the right outcomes to monitor both delivery and impact of approaches	30
Examining the fit and practicality for school context	28
Identifying and agreeing with your school community a key priority that is amenable to change	22
Exploring and choosing amongst approaches	21

Selecting strategies that support introducing new approaches	19
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The next questions asked school leaders, 'What does the term "implementation" mean to you?' Respondents could select up to five definitions taken from policy, guidance, and theory. Seventy schools agreed with a process-related definition of implementation ('the process of putting a decision or plan into practice'). This was selected more often than a stage-related definition ('a series of stages relating to thinking about, preparing for, delivering, and sustaining change') (n=41). Respondents were more likely to endorse a definition that related to implementation as the moment of introducing and intervention ('when an innovation is put into practice') (n=40) than an Ofsted-related definition ('the way in which the curriculum is taught at subject and classroom level') (n=24; see Table 13).

Table 13: What does the term 'implementation' mean to you? (n = 89)

Answer	Number
The process of putting a decision or plan into practice	70
A series of stages relating to thinking about, preparing for, delivering, and sustaining change	41
When an innovation is put into practice	40
Making and acting on evidence-informed decisions	30
The transition from evidence about an approach to use in real life settings	30
Adapting new policies and processes to suit different contexts (school, classroom, individual/groups of learners)	26
The way in which the curriculum is taught at subject and classroom level	24
Methods to promote the systematic uptake of research findings and evidence-based practices into routine practice	23
How organisations enact or deal with any improvement processes	21
What organisations do to change and be more effective	15

Twenty-three respondents reported that they had read the EEF guidance report 'Putting Evidence to Work: A School's Guide to Implementation' whereas eight said they had not. Another optional question followed asking how useful those respondents who had read the report found each section. Table 14 shows that while most found each section useful, the sections on foundations for good implementation were found 'very useful' by most participants. Although participants often found the section on 'prepare' very useful (n=9), they were more likely to say this section was of limited use (n=2).

Table 14: Areas of current guidance deemed most useful (n = 21)

Section	Very useful	Useful	Limited use	Not useful	Have not read/do not recall
Section 1 and 2: foundations for good implementation	11	9	1	0	0

Section 3: explore: Define the problem you want to solve and identify appropriate programmes or practices to implement.	8	12	1	0	0
Section 4: prepare: Create a clear implementation plan, judge the readiness of the school to deliver that plan, then prepare staff and resources.	9	10	2	0	0
Section 5: deliver: Support staff, monitor progress, solve problems, and adapt strategies as the approach is used for the first time.	9	12	0	0	0
Section 6: sustain: Plan for sustaining and scaling an intervention from the outset and continuously acknowledge and nurture its use.	7	14	0	0	0

The next question asked how useful respondents found aspects of the guidance report and additional resources. Resources which were rated as very useful by the highest number of people were 'example of implementation plans' (n=11), 'summary of recommendations poster' (n=8), and 'implementation plan template' (n=8). Resources which were rated as very useful by the fewest number of people were 'case studies' (n=5), 'active ingredients summary', (n=5) and the 'gathering and interpreting data summary' (n=3). It is of interest that examples of implementation plans are considered more useful than the template or examples show through case studies.

Table 15: How useful respondents found aspects of the guidance report and additional resources (n=18)

Feature	Very useful	Useful	Limited use	Not useful	Have not read/do not recall
Implementation process diagram	6	9	2	0	0
End of section checklist questions	7	9	1	0	1
Case studies	5	8	3	1	1
Summary of recommendations poster	8	9	1	0	0
Implementation plan template	8	7	3	0	0
Example of implementation plans	11	5	2	0	0
Active ingredients summary	5	11	2	0	0
Gathering and interpreting data summary	3	12	3	0	0
Master checklist	6	10	2	0	0

Differences between school types

We ran some additional analyses requested by the guidance report panel to see if there were any noticeable differences in survey responses between some school types. We considered Ofsted grade and whether respondents answered about approaches they implemented in multiple schools versus a single school.

Schools that were graded by Ofsted as ‘outstanding’ or ‘good’ were more likely than those graded ‘requires improvement’ or ‘inadequate’ to:

- consult with school stakeholders about an improvement need and not use pupil data;
- consider fit of the intervention with their school, try out different approaches, pilot an approach;
- create a structured implementation plan; or
- not work with external organisations.

Respondents answering about implementation in multiple schools rather than one school were more likely to:

- consult school vision or policy, external organisations, and academic research but not pupil attainment data or colleagues about an improvement need;
- not strongly agree that they ensured staff perceived the approach was better than established practice;
- work with external organisations;
- believe staff delivering the approach received effective training;
- strongly agree with a range of practice designed to help put an approach into practice, such as trusting staff, supporting staff, piloting, staff understanding the approach, and staff adapting the approach;
- strongly agree staff could express concerns and the approach was successful;
- disagree that the approach has been adapted to school context;
- value advice on assessing readiness; and
- find EEF guidance report and resources very useful.

Phase 2—interviews

First interviews

The first interviews were centred around a range of improvement needs including student attendance, love of reading, literacy skills, behaviour, pupils’ ability to self-reflect, as well as the curriculum and teacher confidence to manage behaviour. Table 16 shows a summary of the improvement needs identified by each interviewee, as well as their school phase, school type, and deprivation level. One survey respondent selected the option for a group interview: we interviewed both the headteacher who completed the survey and the deputy head who was highly involved in implementing the approach to behaviour in their school.

Table 16: Summary of improvement needs, school phase, school type, and deprivation level identified by each interviewee

Pseudonym	Phase	Type	Deprivation	Improvement need
Edward	16+	Academy	Very deprived	Attendance
Oliver	Primary	Community	Not very deprived (10–19% PP)	Reading levels
Chris and Paul	Secondary	Foundation	Deprived (40–59% PP)	Behaviour
Amelia	Multiple primaries (introduced in three)	Multiple	Not applicable	Curriculum development
George	Secondary	Foundation	Not very deprived (10–19% PP)	Enhancing Social and Cultural capital
Thomas	Primary and secondary (introduced in the whole trust [2-9 schools])	Independent (social, emotional, mental health school)	Not provided	Pupils attitude towards literature and literacy
David	14–19	UTC	Not provided	Pupil self-reflection

Jess	Primary	Community	Somewhat deprived (20–29% pp)	Reading
Ethan	Secondary	Independent (social, emotional, mental health school)	Deprived (40–59% pp)	Behaviour
Sophie	Primary, Sec, FE (works in 2–9 schools)	Multiple	Not applicable	Behaviour
Nick	Secondary	Free	Somewhat deprived (20–39%)	Teaching and learning
Andrew	Primary	SEMH	Very deprived (50%+ PP)	School culture (moving towards a values led approach)

Eleven themes were identified through the framework analysis, with three of the themes (fit of approach, planning, and data) having two subthemes.

Selecting an approach

The school improvement needs were identified from routinely collected school data, the school development plan, comparison to national averages, Ofsted feedback, observations within the school, and by having a culture of inquiry among staff. The interviewees reported little tension between the needs identified internally and by external visitors or evaluation. As captured in the surveys, some interviewees described approaches designed within the school (such as writing a new policy) and others described purchasing interventions (such as Reading Wise and Literacy Tree). The approaches were selected based on research, staff input, observation of current practice within school and in other schools, value for money, availability of resources, cost, ease of use, fit and feasibility, extent to which it structured teachers practice, benefit over established practice, experience, and intuition. The following quote captures why research was used to select an intervention in one school:

‘Over the years several initiatives have come through. And a lot of them have been short term and low impact. And I think one of the key reasons for that has been they’ve not been based on research-based evidence, and therefore we decided that rather than jumping to the latest initiative, or, you know, quick fix for education, actually, it was better to bide our time do the research and look at the evidence’ (George, headteacher).

Fit of approach: logistical

We also aimed to understand how an approach fits their school and anything done to aid this. Examining school finances was a key aspect of preparation and fit. This included identifying ways to fund a new approach, asking the local authority, and increasing pupil numbers and restructuring staff into a more efficient system. In one school, the headteacher wanted to reduce the number of subjects that individuals were responsible for in a primary school and found that funding was key to this:

‘We came up with a management structure and, with some encouragement, staff lead subjects they are really passionate about. Then I had to stop and think how would I pay for that? How would that work?’ (Amelia, executive headteacher).

Fit of approach: values

The extent to which an approach fit the school vision and values held by individuals was important in addition to these structural considerations. One school highlighted that the alignment of the intervention with individuals’ values allowed staff to buy in to the new approach:

'Then it's how well it [the approach] aligns with their own values. And some people it doesn't quite align with their values. So, they're a little bit slower to see its value and take it on board' (Ethan, assistant headteacher).

Simplicity and clarity

Interviews suggest that the school leader has a central role in setting a clear vision and facilitating the set-up and maintenance of clear, simple policies. Simplicity may not be about taking the complexities or nuances out of a practice; instead, it provides an understandable framework for implementation:

'If you don't set out that clear vision at the start of why are we here, what we do this for, what are the needs of the students and build everything around this it is going to seem a bit disjointed to people' (Andrew, headteacher).

'You can only really be better if you're clear. But that doesn't mean all of the staff have to engage with the breadth and depth of complexity. Being, making something simple, is also an intellectual activity. It's not dumbing down. You can be simple with relentlessly high expectations' (Sophie, headteacher).

Staff motivation

Staff motivation was described as highly important to successful implementation. For example, it was important to motivate key staff members early in the process because this would facilitate the buy-in of other, possibly more apprehensive, staff members. Motivation to engage with a new intervention was sometimes alluded to in relation to personal characteristics, such as their values, moral compass, and level of commitment.

However, interviewees also spoke about contextual factors that influenced staff motivation such as the extent to which meetings are solution-focused and the extent to which training builds confidence.

Funding

School leaders discussed their sources and availability of funding and how this impacted their decisions to adopt a given approach, staff motivation, and practical considerations on how to begin implementation. For instance, one interviewee chose to introduce changes in a limited number of classes due to funding, but this would not have been their first choice. Value for money and ability to adapt resources to their school were also important considerations. Amelia saw value in buying resources that provided a framework to work from and supplementing this by writing their own materials to improve the fit with their context:

'So for £200 we bought something that we then fit it into our school. So it was that balance. It made a difference, that mixed economy of writing and buying' (Amelia, executive headteacher).

Planning: phasing in the approach

In most cases, an initial plan was drawn up by the headteacher and then there were various levels of input from the SLT, a champion, and/or students seen across interviews. The plans were described as iterative, a framework, collaborative, self-evaluative, flexible, and structured. Visualising plans and creating diagrams helped interviewees to communicate their plans to wider staff teams.

Some described a comprehensive plan that was informed by research and data that allowed phasing in the approach. One reason that a phased introduction facilitated implementation is because it allowed initial wins to be observed and this helped to gain staff buy-in. One headteacher also spoke about the ethical considerations, making sure the approach would not be detrimental to students by piloting on a small scale before rolling it out across the school:

'Try it with a couple of classes, just to make sure it's not detrimental for them. We tried that process over a half term and then I made it very, very clear after that half term that the control groups that didn't have it would not make anywhere near as much progress as the groups who had it' (David, headteacher).

Planning: professional development

Planning also included reflections on what skills staff would need to deliver the new practices. Leaders acknowledged that they needed to provide staff with support and designate time to build appropriate skills. The following quote captures how professional development feeds into implementation planning:

'At the very beginning, it was about the self-evaluation document, writing that into a comprehensive school development plan. Then working out what basics we had on site, what training we needed as staff, were staff capable of teaching early literacy, and then looking at what do people outside offer' (Thomas, executive headteacher).

Relationships

The school leader's role shifted throughout the implementation process. In the early stages, their experience and vision were the most central themes (i.e. when exploring and planning). Beyond these initial stages, there was more discussion about their ability to manage staff relationships, motivation, and skill. Interviews also reflected the importance of the relationship between the leader and typically the deputy head or champion of the new approach. This relationship seemed to bring the benefit of the headteacher's experience and the deputy/champion's ability to liaise with wider staff groups and to move the project forward as their own. The following quote highlights why Jess chose Ellie (a middle leader) to champion the approach:

'I thought she would be keen to adopt the approach, and would also be able to bring others on board as well [...] I think people respect her and are open to her suggestions [...] she's not threatening in any way' (Jess, assistant headteacher).

Data: to demonstrate benefit over previous practice

Interviewees reports varied in terms of the type of data used, when it was used and who used it. There was agreement that effective data-use happened early, frequently, and was communicated to staff. Most interviewees highly valued data such as staff and pupil surveys, book, and work scrutiny and routinely collected data such as absences, exclusions, reward points, behaviour points, and grades. One key use of data was to demonstrate benefit over previous practice:

'Our school improvement advisor was very keen on monitoring everything. So he made us keep the data and log it on our school improvement plan. The benefit of that, in hindsight, although we didn't realise at the time is, we've got a very clear record of the changes' (Chris, headteacher).

That said, others discussed the need to avoid focusing too much on long-term outcomes. This included opting not to use objective data but rather to measure early successes in terms of the perceptions of those staff and pupils involved in the new practice.

Data: to reflect

Interviewees also used data to facilitate reflection. This was a critical aspect to identifying what worked and did not:

'It's making sure that whatever process you have, every little bit of that process works. And if it doesn't, you go back in and find, right, that's where the problem was, let's act on that, put some resource in it, or whatever else it is' (Edward, headteacher).

One leader also commented on the need to set realistic expectations for staff, such as a dip in performance around the initial introduction of a new approach, as well as the impact that data and monitoring can have on staff motivation, both positive and negative:

'If you just monitor, monitor, monitor, you kill the spirit of people. And so some people have found that really tough, that we keep going on, like, have you checked? do you know what the people in your team are doing?' (Nick, headteacher).

Implementation climate

Some interviewees described the increased capability of staff to implement new ideas through experience, including training and mentoring received during implementation. School leaders reported increasingly supporting new initiatives that other members of staff explore themselves. After increased experience and capability for implementation in their schools, their implementation leadership roles gradually have greater emphasis on focusing the ideas of others:

'Staff I had tend to be a bit more progressive in their approach, or radical [...] they're much more likely to challenge these assumptions anyway, because that's an environment we've fostered' (David, headteacher).

Support

Wider school community support, such as support from families, was mentioned but was not a strong feature across interviews. Whereas buy-in from governors and trustees was reported as necessary by all interviewees but was forthcoming.

Summary

Interviews showed that improvement needs were identified from a range of data, not just through discussion with members of the school community. Intervention features such as research evidence, fit with the school, feasibility, and resource availability were key factors in selecting an approach. Leaders reported that staff motivation was important, as well as availability of funding and support from governors or trustees. Implementation planning tended to start with the school leader before becoming shared in their development. Professional development was important to plan for. The leaders' role was explained as changing over time, moving from responsibility to supporting champions. Data to measure outcomes was considered important, although initially this was more to indicate promise and benefit of a new approach. Experience of implementation tended to encourage staff to get more involved in future implementation. We were surprised to see no indication of an implementation team or working with external experts on an approach.

Second interviews

All four interviewees were asked about if and how the approach that they spoke about in the first interview and its implementation had changed in the five months between interviews. This was the focus of the first section of the interview. We then followed up on key ideas from their first interview (such as key challenges or facilitators they had experienced) and asked for their opinions on key tensions and themes that had been revealed from early analysis in WP4.

Evolving nature of relationships

In one interview, we were able to interview two staff members who had an instrumental role in the implementation of a new behaviour policy. In their second interview, they described changes to their relationship over the course of implementation. The headteacher and assistant headteacher developed more trust throughout the process and felt more confident that they had the same vision over time. This reduced the need for very frequent communication and this allowed them to make decisions more independently:

'I think now we're at a point where we're, we're both thinking on the same page, I don't need to run everything by Chris, he trusts me to do it. I trust him on other things as well [...] the relationship is developed. And there's some days [we] don't even see each other anymore' (Paul, assistant head).

A headteacher in a different school described other staff members taking a more independent leadership role:

'The significant thing that's been changing there is my role as the initiator—and what am I doing? I'm very much stepping further and further back now as it's gaining speed. So we're at the stage where aside from engineering, where I'm directly intervening to get it moving in the first place, the other subjects I have very little direct involvement, because that's now cascaded to the individual leads, so running with that. My role is to just look at—is it a risk of deviating away from the original ethos?' (David, headteacher).

Monitoring progress

There were also adjustments to the type of data being monitored over time. For example, Chris and Paul who had spoken about a new behaviour policy in the first interview identified that staff were increasingly concerned about low level disruption, so began to track this outcome in addition to the previously planned, longer-term, outcomes of suspensions and exclusions. In the beginning, they monitored progress using their primary outcome but recognised how important it was to sustain staff buy-in with other relevant data.

Reflection

Reflection occurred as an activity for the school leader to engage with in relation to their original vision for the intervention. In addition, it was discussed as a skill that school leaders felt responsible for fostering among their staff members, which may be achieved through organic, ad-hoc discussion, as well as more formalised professional development. Reflection in relation to implementation was therefore considered different to critical reflection in relation to teaching. Sophie felt it was challenging to sustain a reflective mindset among staff. However, her and Thomas described the long-term benefits to developing this skill amongst staff as a thinking culture. For example, she saw staff were developing opinions on evidence and having debates that contributed to their thinking on improvement:

'There are some leaders who have been brought up to give people answers. And when you're tired or when you're stressed, sometimes it's easy to tell somebody what to do. Take the time to ask them what they're going to do. Some situations require that, so I think it's a constant effort' (Sophie, headteacher).

'Staff are correcting each other, which is a really lovely piece of peer work. So, if they started the book, they're not waiting for the SLT to tell them that they haven't done something great. Somebody will walk into the room and go, why have you jumped three steps?' (Thomas, executive headteacher).

Systems and structures

Chris (headteacher) described that systems were being made tighter and more rigorous over time. This was particularly true in relation to monitoring. This could indicate that, over time, focus on getting the new practice right might then shift to getting the associated support to sustain the intervention equally tight:

'It's a similar three targets mid-year review. But the deadlines didn't always happen, the things weren't collected, the meetings weren't quite as tight as they are now, there wasn't guidance as there is around the intervention. So, it's just, I think, we use a fairly basic, common system, and just made sure it's tight and rigorous and followed' (Chris (headteacher)).

Thomas described a benefit to using a bought-in intervention, because they could connect with other schools using the same resources:

'When you do anything with one of these schemes, tweet it, and then you get conversation with other schools. So, whereas in the past, you may have been isolated, actually, what you now get is the dialogue between practitioners' (Thomas, executive headteacher).

Parent/community, pupil, and external stakeholder involvement

The interviews indicate that there was greater involvement of parents and external community partners as implementation progressed. Chris expressed plans to engage parents more, although this was in the early phases of development. Similarly, David invited greater input from external partners in later stages of the implementation:

'We've got the staff association that are very keen and are beginning to think about moving forward about the work we do with parents that we don't have at the moment. We're setting up councils for the key stages with parents to try and start having more input with a community' (Chris, headteacher).

'We've partnered with big research and development companies [...] we're asking industry and then we change what we do to meet the needs of industry' (David, headteacher).

Student voice was mentioned more often in second interviews as a highly valued method of monitoring. In one school, there was a formal system to facilitate student feedback, from student, parent, and staff surveys and the student council, which the headteacher felt was quite typical. However, the interviewee commented on the level of engagement from pupils indicating that they felt more empowered to contribute:

'They are quite empowered to say, it's feeling quite different ... it's not just a [feedback] system that's imposed on them' (Thomas, headteacher).

Sophie also felt that stakeholders, particularly pupils, needed to be involved in the early stages of planning. Rather than feeding back their input on plans, it is more valuable for them to really co-own the project:

'We were very proud of our work and thought it was great. And we were going to roll it out. Somebody was very clever and said, I've got a working group of kids, and we'll go through it with them. The kids are like, oh, that is so old fashioned! That is so typical, that's written by an adult [...] it's the youngsters saying, "No that won't work. But if you do it like this, it will work"' (Sophie, headteacher).

Collaboration and resilience

The interviews indicate changes to the extent of collaboration required between staff members as implementation progressed. In Chris' school, the senior leadership team had expanded to three deputy headteachers. This allowed

each individual to focus on one aspect of school development and gave them time to begin planning for the following year. Similarly, Sophie experienced a change in leadership from single to shared headship. She recognised the benefits of having increased support as well as the challenges of collaboration.

In contrast, David reflected on staff shortages. For him, this reinforced the utility of having a clear system because it provided the school with some resiliency to staff changes and shortages:

'It's reinforced this system. When I've had a member of science off because the pathway system is in place, it's very, very clear where the students are at and what the next few steps are. So even if that member of staff was so ill, that they're unavailable to then teach, anyone who's stepping into cover can go well, I know exactly what I need to teach next. And I know exactly where the students' competence is' (David, headteacher).

Intervention changing the school culture

This theme highlights that over time, individuals in the school community become more accustomed to the new practice and a new set of standards and expectations are set. It may indicate that sustaining a whole-school approach takes several years until the majority of students only know that practice. For Chris, this was particularly true of the student population:

'Now the children in Year 7 and 8 have only known this, and the children in Year 9 don't really remember what it was like before anyway. When the current Year 11 go, they will probably be the last year group that really remember anything how it was before and sometimes act in that way. And I think from that point onwards, it's our school that the children know, and those that are staying to the sixth form, you know, they will only stay because they know that the school is a better place than it previously was. So, there was definitely a shift in the culture of the children' (Chris, headteacher).

Follow-up on key ideas from first interview

Opportunities to get buy-in if the school is in a crisis situation

In the first interviews, there was some indication that schools might find it easier to introduce change when they are in a crisis situation, such as being close to closure. This situation may give them permission to be creative and reset the school vision. In addition, people in the school community might be more willing to try innovations compared to schools that are content with their current practice. However, this might only relate to initial buy-in and adoption. In the second interviews, Chris reflected on this:

'I think with regards to sort of selling a strategy, a vision was fairly easy for a school that was quite broken, and staff that that had been let down in the past. I think that's easier. I think we've probably realised, at the time, we thought we were sort of in the really hard bit. I think the hard bit is now to be honest, of keep stepping things up, keep improving things. Yeah, we got that those quick wins early on those improvements. We were seeing staff were feeling better. The behaviour was improving. It's now at that point where things are good. But things could be better. And that is a difficult one, I think' (Chris, headteacher).

Planning

In the first interviews, plans were described as iterative, a framework, collaborative, self-evaluative, flexible, and structured. This approach to planning was also evident in the follow-up interviews. Again, interviewees highlighted the importance of sustaining a clear vision for the approach and simplifying potentially complex plans:

'I think its skeleton is a good analogy. So, you've got that core that you shouldn't deviate from, and that's the original vision and what you're trying to achieve. That's the bit you communicate. So, it's not a heavy policy or restrictive in that sense but it also stops things from disappearing completely off. I'm not saying it's right or wrong, because you can have very, very restrictive policies which could work is just, that's not the way we do it' –(David, headteacher).

Reflections on key themes and tensions in literature

School leader role in implementation

Interviewees were asked to reflect on what key leadership qualities facilitated implementation and what a leadership mindset meant to them. Thomas felt it was important to place trust in the professional judgement of his colleagues. This trust demonstrates that he values their opinion, experiences, and perhaps requires an openness and willingness to learn:

‘Demonstrating to your staff that you’re not frightened of something new... The worst thing I could ever tell my staff is I know better. Because I really don’t, I’m not in a classroom with those kids every single day of the week. As long as they can evidence why, then, as far as I’m concerned, you get on with it, because it’s your professional judgement’ (Thomas, executive headteacher).

Similarly, Chris felt that good leadership is underpinned by relationships and treating people with respect in line with his moral compass:

‘Leadership is only really working with other people, my job is to make sure other people are doing their job. And the only way that can work is by building relationships with people that are going to be successful. And all the books and stuff that you look at, and you read through and everything. But one thing that seems to be the common theme across everything is it’s about relationships’ (Chris, headteacher).

In addition, Chris indicated that the leadership qualities required for implementation may change over time. In the beginning phases he felt a strong responsibility to model behaviour. Over time he has transitioned away from this, perhaps to share this responsibility more widely with other staff members and demonstrate his trust in their understanding of the policy:

‘I would really make a point of talking nicely to pupils in front of staff, really trying to build those relationships. If I was in the dining hall, I would really be conscious that staff were seeing me and making sure I was doing that. I think that definitely helped get staff on board [...] Definitely this year, I have consciously tried not to get involved in those things, because I trust the staff as well. It’s taken a little bit of time, but we all know the policy’ (Chris, headteacher).

Incentives

Interviewees were asked to reflect on what has helped to incentivise staff members with the implementation effort. Responses speak to the role of external accountability and observing positive student outcomes rather than financial incentives for individuals or the school:

‘It’s not necessarily about funding. It’s about understanding the context of your cohort. And the incentivization of that is then is this going to have an impact? And is it going to have the impact I want? Will my kids read? Will my kids pick up a book at the end of this and go, “Oh, look, it’s a book”’ (Thomas, executive headteacher).

Intervention features

Interviewees were asked to reflect on any aspects of the approaches implemented that they felt impacted the implementation process. Sophie reflected on a new approach to teaching online safety and how this was triggered by collective engagement with high quality evidence:

‘That review indicated that none of us in schools had a clue about the extent [of the issue]. So, it’s probably the combination of really, you know, using good quality evidence to inform questions and thoughts. Yeah, the fact that there’s a level of expectation from everybody to engage in the solutions and finding a way forward and an interest in developing professionally.’

Finally, Thomas spoke about the relationship between understanding his own school context and the rationale for a given intervention structure. He suggested that most interventions can be adapted to context, but it is important to consider whether it should be adapted:

'There are some interventions that don't lend themselves well to being adapted. Okay. And I think that depends on you as an organisation on whether or not that that rigidity is what you need. So, for example, if you were doing a dyslexia intervention, there may be a real clear, therapeutic reason why it has to be delivered that way. Otherwise, you're not going to get the progress you need. I would say, you could take the vast majority of interventions and it includes mental health, not just academic work. And I think you can make it fit your context' (Thomas, executive headteacher).

Summary

These interviews allowed consideration of changes over time; this included other staff having taken more responsibility. However, many themes were reiterated from the first interview, such as plans being iterative and evidence and adaptability being important intervention features. Data collection changed over time and sometimes might change in order to maintain staff buy-in. Surprisingly, some schools reported more involvement of families, pupils, and external partners over time rather than when preparing to put a new approach into practice. Some participants noted that level of buy-in to a changed approach is likely to vary across contexts.

Focus Groups

Twenty-eight experienced users of the guidance report participated in six focus groups. Themes were similar from research school network colleagues and those experienced users in other organisations delivering professional development to schools and using the guidance in their own practice. Therefore, themes are representative of the majority of participants who provided feedback. There were three main areas of discussion, and the themes are organised according to these:

Section 1: key strengths of the guidance, how it is used and what works well.

Section 2: key barriers when using the guidance.

Section 3: key areas which the guidance could build on.

Strengths

How the guidance is useful

One key message of the guidance that resonates with users is **that implementation is a process not an event**. Users felt that the more people engage with it, the more significant and useful it becomes and that the report's messages are about acting in a more considered, thoughtful way. A strength of the guidance is recognised as **enabling the process of thinking** through tough questions around implementation.

The guidance was often described as a gamechanger in the sense that **it is reflecting what many users have felt for a long time**. Users recognised that there was already an emphasis on the **who, why, where, when, and how of implementation**. For example, that implementation is intertwined with leadership; that implementation is tied into culture and ethos; that to sustain an intervention in a school, you must get relationships right. The guidance was often described as capturing these ways of thinking about implementation. Whereas prior to having the guidance, implementation was often misunderstood or focused on pacy, swift, pressurised change.

The consistent and specialised language of implementation across the guidance and now its increasing use in Ofsted and DfE documents is helping to avoid confusion about what implementation is and to understand the entire process. The guidance report is therefore helping to **establish a common language of implementation** across education.

Users recognised the importance of implementation: as one participant recognised there has never been a more crucial time for effective implementation post Covid. **Great programmes or practices implemented badly** are considered a major issue and it was felt that this can be addressed if we can move knowledge around the system more effectively.

Associated resources are considered helpful. Particular aspects mentioned were the **case studies, planning templates, and the sharper focus on effective professional development**. However, while **case studies in video format** attached to various stages of implementation are useful, there was a feeling this can be expanded. A wider range of diverse contexts could be seen. For example, where practice requires improvement as well as where practice aims to move from good to outstanding. Specifically, a case study of a school that has followed guidance in full despite pressures for improvement would help dispel the myth that the guidance is not for change under pressure. The one-page format of the implementation planning template is considered helpful as it helps to remove feelings of being overwhelmed.

How the guidance is used.

The use of the guidance and resources is indicated above. But more specific examples include how the guidance **acts as a high-level framework to anchor implementation**. It helps to encourage constant reflection, explore and communicate where schools are in the journey, take stock, and prevents quick decisions. The guidance report and aspects of it have been used as a thinking tool. It is useful to get school leaders to reflect on **why** effective implementation is important, focusing on process over product, to secure deeper understanding and buy in rather than implementation seen as a 'bolt on' to using new approaches.

The guidance is helping to **structure training sessions and facilitation** well in many cases. Training is often not focused on implementation but refers participants to the guidance report and introduces key ideas, as well as signposting to specific resources and reading from the guidance report rather than as a whole product. Many users shared **enthusiasm for the circular graphic, which visualises the key stages**. This was used successfully as a training and planning prompt.

The 'explore' section was mentioned in particular as providing a key prompt to show the importance of **creating the time and space to consider the problem/priority/challenge that a school faces**. There was a feeling that often schools, and indeed trainers, go in with solutions before thinking more about the nature of problems. The message about slowing down at this stage is useful.

Barriers

Five themes captured key barriers that users recognised in terms of using the guidance in practice. These tended to indicate where this is friction between the recommendations in the guidance and the realities of some schools, rather than about limitations of the guidance.

Tensions between going quick or slow

Tensions were recognised between schools' cultures often being focused on pacy actions that require quick results and the message of the guidance report, which emphasises process over an event. While the recognition of school climate in foundations was considered key to reflect on as a first step around implementation, it is inevitable that accountability to DfE, Ofsted, and other stakeholders will create pressure to implement quickly and achieve impact quickly versus the guidance to implement carefully and plan to sustain from the outset.

Many users reported that schools felt uncertain and uncomfortable with slowing down to reflect and felt a pressure to be seen as doing a good job by getting instant results. This created a barrier to using the report guidance in an effective way as intended and extended to expectations of quick wins resulting from professional development run by research schools. Users discussed a need for greater resources such as identifying support strategies around time/planning and how planning is part of a cycle that is revisited and adapted.

There was a feeling that schools subscribe to an ethos of 'less is more'. But the system they work in continues to challenge this. It was noted that it takes courage to take time to get things right. It was suggested that the guidance needs to recognise this and illustrate how schools in the most challenging contexts have adopted implementation practices which have benefited them and their children and how the full approach as a process has been recognised as right and impactful by those the school is accountable to.

Using the guidance report and resources effectively and as intended

The above time pressure has led to incorrect use, a lack of confidence, or capacity/capabilities of schools to use the guidance report and its resources effectively. Users talked about schools attempting to overlay existing practice or planning onto EEF resources, losing the key messages of reflection and collaboration as well as using current experiences and monitoring to inform decisions.

The guidance may be seen to assume the skills are in place or can readily be identified, taught, and learnt to enable effective and successful use of the guidance throughout the implementation process meaning it is often not enough to follow the guidance: there are prerequisite implementation skills needed. Some thought is therefore implied to potentially develop pre-implementation guidance to outline the prerequisites and support users to be ready to enact the implementation process as outlined in the guidance report. The provision of implementation professional development, not focused on implementing a particular approach, would help, as one participant suggested. A few users mentioned that implementation training ought not be limited to inset days and it must be iterative and linked to project planning effectively.

Language and definitions

Users felt that the guidance has helped to codify the logic and that it has helped to add in the critical elements of implementation, which are deeper than the elements which make up a rapid change mentality. That said, one of the things discussed by users was in relation to commonalities in language around implementation. There was a concern

that when you talk about 'implementation' with people, you are not always talking about the same thing. What implementation is, and where implementation starts and ends, can differ according to individual and context.

Foundations are described as important in the report, but more emphasis and detail around what they are is needed. For example, what culture is, in terms of scope and tangible actions, was sometimes a barrier for users. Perceived lack of detail around how schools might explore foundational factors themselves during the explore stage was noted as inhibiting use of the guidance or was suggested to make the foundations and explore stage feel less important than it really is.

The term 'active ingredients' was an obstacle for some users. The term was considered useful, when understood well, but it could be challenging to take the concept and understand how it works in each school context. Example implementation plans do not always seem to identify active ingredients at the same level of specificity. Some users felt that more examples help to illuminate what active ingredients are and why this type of analogy is useful in term of implementation. Non-examples were suggested as helping here and for other trickier concepts. Some mistake active ingredients for implementation strategies, which are more enablers. The most useful illustrations that appear to have been better understood by leaders are around fidelity to the chosen programme. Similarly, the language of mechanisms and what they consist of sometimes added confusion.

One focus group proposed the use of the term 'support strategies' as being potentially useful to show how these are not active ingredients of an intervention or mechanisms of implementation. Support strategies here was seen to mean enablers indirectly related to an intervention to be successful that are not part of intervention or an implementation strategy. For example, improved behaviour to support a reading intervention.

Tension between complexity and simplicity

Many users described how on the one hand the guidance had challenged them as individuals to expand their thinking and reflect on new ways of interpreting implementation (such as through the analogy of active ingredients), however, users who had professional responsibilities as trainers felt that they had the time and incentive to reflect on innovative ideas and language in ways that school-based teachers often did not. Therefore, they felt that they were often asking a lot of teachers in terms getting them to think 'outside of the box'.

On the other hand, users also reflected that a strength of the guidance was its innovation and ways of introducing new thinking about implementation, which could develop stronger changes for schools in the long term, therefore they didn't want the report to shy away from new language and ideas. Further examples were suggested to help simplify complex ideas. This would help in exposing schools to new ideas and shifts in mindsets and practices, reiterating that implementation does take a lot of time.

Examples of implementation need to show how schools can create conditions for effective implementation despite external pressures and how schools have gone about getting conditions right. Examples should show that sometimes it takes some hard conversations and significant changes to operation and routines, this ought to be acknowledged, but showing the potential for improvement.

The guidance report is considered complex and often something where sections or resources might initially be signposted and used in isolation; rather than expecting individuals in school to read the whole report from beginning to end, there was a desire to have a highlights style document to provide a simpler, quicker, and priority-focused document. One contributor mentioned the 'best bets' of implementation. There was a sense that through signposting schools to these practical aspects of the guidance, they then tended to find and digest the wider report and resources.

Research to practice divide

Users recognised that there was a need to counter cynicism. Schools would benefit from some acknowledgement that the guidance may be 'great in theory' but needs to be resilient when challenges are faced or help to identify, pre-empt, and respond to predictable challenges.

For some users, the guidance report presented an idealised view of schools and did not reflect its messiness and unpredictability. The guidance might capture the realities of barriers to implementation, for example, heads working across schools, staff absence and turnover, Ofsted inspections changing focus, budget shortfalls, and events related to COVID-19. Examples of how schools have navigated such challenges, the lessons learnt, and guidance on how to plan for the unplanned whilst managing everything else was called for. There was some discussion about whether some of the barriers could be planned for in advance or recognition of 'pinch points' where implementation may be challenging but that this could be pre-empted in many situations.

Key areas for improvement

Some specific areas for improvement were indicated in focus groups and these are summarised in themes here. Many have been indicated in relation to specificity and importance of elements of the current guidance and resources above.

Emphasis on foundations and its implications for effective implementation

While it is agreed that the foundations for implementation are important, there is a need to go further in terms of definitions (for climate in particular) as well as strategies for engaging schools with exploring these foundations in their own context—what the process might look like and how can this be more practical. Schools cannot change leadership or climate before addressing a priority. Therefore, respondents queried: what foundations need to be addressed first? What strategies/tools/resources can help schools to think about foundations in relation to implementation? Who needs to be involved when and in what ways?

Culture was recognised as a key factor in successful implementations. To support schools to understand what the 'right' implementation culture is and orientate towards it, some felt it would be helpful for this to be defined including its terms, constituents, and how it can be sustained and explained.

'Right' implementation team

More guidance would be helpful on how to set up and sustain implementation teams, with their roles and responsibilities outlined. Also, how to identify skill deficits, for example in project planning. There was also a sense that the focus on teams responsible for implementation should bring to the fore the role of school leaders. Sometimes the guidance or the reality in school can seem more directed toward the person who may be leading on a new approach or the teachers who will be delivering the approach. However, it was recognised that without the support or direction of senior leaders, teachers may lack the capacity to follow the guidance with fidelity. On the other hand, some felt guidance was more exclusively for leaders and, therefore, that there might be more guidance or examples for subject leads or staff in particular leadership roles.

What, when, why and how to use the resources effectively at various stages of the implementation process

There was a sense that the guidance breaks down implementation into clear, consecutive stages, which is accessible for those new to implementation or tasked with selecting and introducing a new intervention in their schools. However, things are recognised as more fluid than this and therefore resources and guidance risks either being seen as relevant at one point in time, or it is unclear when schools might engage with certain resources. There could be more guidance on how to model and scaffold use of the report across various school and training contexts.

This implies the benefit of more variation in the case studies, video resources, and key concepts and critical questions as well as more focus on identifying barriers and how to overcome them. Examples of implementation practice that did not go so well, or examples of de-implementation, were perceived to help if it was possible to have schools share this.

Making common pitfalls and misconceptions more explicit

Recommendations from users here tended to be around exemplifying what may be barriers so that these can be considered in advance and explored in depth when necessary. Tensions in evaluating change were recognised—with pressure to measure by (hard) outcomes and show fast results, rather than measuring the implementation and carefully considering what might be barriers and any adaptations. There is a lack of tools for schools to measure implementation and therefore schools may default to measuring impact on pupils early. Sharing of good implementation practice may also centre more on how schools can be resilient and overcome challenges in mindsets, skillsets, and relationships.

There was a sense of misconceptions around implementation and aspects of it. Therefore, some suggest a need to shift mindsets around implementation being a process (often lengthy) that is a journey rather than destination. A challenge is the different audiences as many school colleagues appreciate this and would benefit from more precision and exemplification around this message. So, there is a need to consider who needs particular messaging, particularly around slowing down, and how the guidance report can reach them best. 'Active ingredients' was mentioned as something with great power when it is understood correctly but often it is misunderstood as mentioned above.

Evolving the graphics

Despite the positive comments about the process diagram as a hook, some felt the need to make it more reflective of complexity and an iterative process. Some participants felt that later stages in the model did not seem to have as much emphasis as 'explore' and 'prepare'. Some users described a sense that the model loses momentum slightly in terms of introducing an intervention, monitoring, and sustaining. Some felt that sustaining momentum was an area that many schools struggle with.

Users communicated a sense that the foundations of implementation were important yet not discussed in enough detail in the report. Foundations, according to many people's experiences, were areas that needed to be nurtured but it was often challenging to understand how to do this practically. The identification of specific strategies which could help around this were perceived as valuable.

Integrating other EEF guidance and evidence

An opportunity was recognised for linking the next iteration of the guidance and resources to other EEF evidence and resources and the potential for the implementation guidance to link out to other guidance and use interventions and topics from other guidance in examples.

Users saw the opportunity in linking the new PD guidance with the implementation guidance. Users recognised a potential link between the Pupil Premium strategy template and how it uses school planning to the implementation guidance principles, e.g., identifying challenges and using evidence-informed programmes and practices.

Strategies

Some users recognised that the current guidance listed implementation strategies but did not go further in how they could be used by those using the report in relation to their responsibilities and roles. Users often felt that the coverage of the stages was comprehensive and, rather than adding more, how the guidance might develop is around going deeper into the current content and showing practical actions that can be used at each stage. For example, around foundations/culture/climate and specific examples of why this is important and how these aspects can be developed.

In relation to senior leadership and implementation, there was a suggestion that implementation strategies could help to show how to move away from a short-sighted to a longer-term approach to school change.

Building guidance and resources around the explore stage

Many users agreed that the 'explore' stage of implementation was critical in maximising the chances of success later. Specifically, focusing on how to effectively examine evidence critically, rather than quickly and in a shallow way, was thought to be a key way the report could continue to evolve to help users. Users thought that unpicking why a priority had emerged at a given time was similarly critical and that this could be made more explicit. Identifying a priority feels unclear and may often be assumed to be recognising an existing priority. So, there would be benefit from understanding how school leaders have grappled with identifying issues and how they have used the process, the false starts, head-scratching, and actual time it takes to come to select a priority area and assess options for approaches that fit this and the school.

Enabling leaders to really understand the problems and challenges with precision can be a stubborn challenge. Whilst the gathering and interpreting data tool was valued, it may be useful to repackage it so it is not felt like a quick one-page form-completion exercise.

The idea of the guidance helping people to understand not only that context really matters but what is meant by context and what sort of influences it has was also proposed as a useful addition.

Several participants wondered whether including something about cognitive biases in the guidance might be helpful. This tended to be around selecting interventions and the rationale for this. More guidance around what cognitive biases are and how they influence implementation processes may be helpful.

Training resources

Aside from suggestions above, there were some more specific suggestions in terms of resources that would be helpful for these experienced users when they are working with schools.

It was suggested that the guidance, or key diagrams, could be converted into PowerPoints for presentation and training purposes.

The planning template could usefully be revised. A user-friendly format would avoid many users having to do re-formatting according to their own style but others felt they needed something more straight forward. Users expressed a need for more guidance around whether their planning proformas should differ depending on stage of adoption or the type of intervention. Essentially, is the planning template the finished article in terms of an implementation plan? If so, there could be structured materials and activities to scaffold thinking through the decisions needed to populate it. This could be in question prompt format. There are only the broad questions rather than a checklist of what to think through currently.

Participants suggested the guidance report better acknowledge that there is often a dearth of evidence evaluating evidence-based practice; this must be discussed more in relation to the explore phase, including how to decipher what is best practice.

Participants described how important data was and that data drove many decisions around the area of focus for implementation. However, there was a recognised need for resources to help schools to use data more effectively for implementation. For example, recognising that schools ought to be interested in different outcomes at various times and ought to be interested in implementation outcomes as well as pupil outcomes.

A community of practice with the ability to ask questions and share resources could be helpful. This could be live or pre-prepared and a useful resource for schools to see how others have dealt with similar issues. Resources in general could better reflect different contexts, situations, and stages of implementation.

Summary

There was a lot of support for the current guidance report and resources. There were tensions noted between messages to take time exploring and preparing for implementation and typical pressures on schools to produce results quickly. More guidance on selecting an intervention and use of research evidence could be provided. Some of the language used is complex, although it was recognised that much of the terminology was now being used in practice and should not necessarily be simplistic. More support in understanding and addressing the foundations of interventions would be valued. More guidance and examples for using the resources would be welcomed. There is a perceived lack of clarity about what an implementation team ought to look like. Sharing misconceptions, mistakes, and non-examples was felt to be helpful. More guidance on both the 'explore' stage and the use of strategies was requested.

Limitations

We are aware that recruitment of school leader participants for research was particularly challenging at the time we ran the survey. Therefore, the lower than expected response rate for the survey is to be expected. We had anticipated from conversations during piloting that school leaders would likely delegate the survey and/or interviews to colleagues leading the implementation of approaches in their school rather than participate themselves or focus on a whole-school approach they felt responsible for. Different responses may well have been received from middle leaders, although one interview participant was a deputy head. The surveys often indicated general agreements with principles from the existing guidance report, with more nuanced responses seen in interviews about the context of the school and approach. The approaches participants told us about in interviews were not always existing manualised interventions and this may affect experiences of implementation. Because of the wide range of approaches being used in schools it was challenging to make comparisons across different contexts both for survey findings and interviews. Finally, despite asking in surveys and interviews for examples of approaches that are no longer being used, participants tended to tell us about successful examples of implementation that were ongoing and therefore may not be representative of most implementation in English schools.

Chapter 4. Work Package 3

Work Package 3 aimed to locate and map primary research studies and reviews that report on implementation factors and strategies in the context of school interventions or demonstrate the impact of implementation factors related to school interventions on implementation outcomes and/or pupils' outcomes. We aimed to identify research exploring and evaluating whether specific implementation strategies or tools improve implementation of interventions in schools (i.e. the impact of implementation strategies). The primary goal of WP3 was therefore to locate literature of relevance for WP4 but also to transparently map reviews conducted to date and the literature that was used in WP4's synthesis. This will address the following research questions.

What research literature exists that investigates how different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation) and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) pupil outcomes?

What research literature exists that investigates the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?

The output of WP3 is two evidence maps which describe the literature located relevant to the research questions and categorise studies according to the characteristics indicated. Evidence maps show what evidence there is, rather than synthesise what the evidence says. It was used to indicate relevant literature for WP4 which as a full review sought to answer relevant aspects of these research questions. The first map reports variables relevant to reviews located. It reports these against broad implementation factors in line with our early work in WP4. It indicates evidence related to implementation strategies but does not specify which strategies. The second map reports all studies (including reviews) that were included in WP4 and indicates what elements of our programme theory they evidence and specific implementation strategies. In a change to the protocol, we felt it was more useful to specify detail on the 293 papers included in WP4 which held relevance and rigour to contribute to our analysis, rather than every study located by the WP3 search; 293 papers (59 reviews and 234 empirical studies) are therefore included in the second map.

Evidence maps involve a systematic search of a broad field of literature to summarise the literature and identify gaps in knowledge and/or future research needs, presenting results in a user-friendly format (Miake-Lye et al., 2016). As well as indicating relevant literature for WP4, the first evidence map shows gaps for research reviews which will be useful too. The second map indicates where there is more and less evidence in relation to intervention type, school phase, implementation outcome, programme theory elements, and implementation strategies. It also considers quality of evidence. The system map of school implementation developed in WP1 helped to identify key factors and processes to inform the search for literature and to organise the first evidence map. We drew upon the range of implementation fields again (implementation science, behaviour change, knowledge translation, school improvement) but the search was restricted to reviews and empirical work with schools. The analysis for WP4 informed the organisation of the second evidence map.

Evidence maps are developed according to a framework that essentially specifies what information from included studies is reported and displayed. The framework specifies the row and column headings and subcategories on which included studies are coded (White et al., 2020). Typically, there is a visual display that shows how many studies under each subcategory fit criteria for the intersection of dimensions across rows and columns. For instance, on the first map a larger circle would indicate that more reviews about secondary schools are focused on behaviour interventions and have evidence about leadership as an implementation factor. A smaller circle would indicate fewer reviews are reporting on early years attainment pupil outcomes and fidelity implementation outcomes. Determining the first map's framework involved piloting by the review team, anticipating revision and refinement as part of this to balance categories that are relevant from our work from prior work packages, are represented in the literature, and a limit to number of categories so the evidence map remains clear to navigate for users. The second map was more deductive as it reports key elements from data extraction and analysis from WP4 in full rather than seeking to balance the number of categories reported.

The following sections describe the methods we used to select relevant literature for these evidence maps and to use in WP4, and how the two maps are organised.

Inclusion and exclusion criteria

Criteria were refined after piloting both title and abstract screening and full text screening. Additions included clarifying that secondary analysis should be included, excluding dissertations, specifying systematic searches as a requirement for reviews, clarifying that school needed to be a major setting for the intervention, excluding studies that were of limited relevance to current education in England. We used flow diagrams, as well as these inclusion criteria, to aid screening decisions and bring consistency to the process followed. Inclusion criteria are presented below:

Work Package 3 criteria

Category	Criteria
Design	<p><i>Include</i> research studies that may be quantitative, qualitative, and mixed-methods evaluations. Include re-analysis of data from research studies.</p> <p><i>Include</i> reviews that systematically identify and synthesise relevant primary research using quantitative, qualitative, and mixed-methods designs. We would expect systematic search and replicable process for identifying included studies. Review aims and inclusion criteria need to fit our inclusion criteria and the majority of included studies need to be relevant.</p> <p><i>Include</i> process evaluations and qualitative research that explores perceptions of how implementation factors (may be expressed as barriers and facilitators) impact on outcomes.</p> <p><i>Exclude</i> dissertations. This was determined during full text screening, given volume of them.</p> <p><i>Exclude</i> conference proceedings and meeting records. Most will only have abstracts.</p>
Setting	<p><i>Include</i> studies that focus on settings which are education institutions catering for 3–18 year olds.</p> <p><i>Exclude</i> studies that focus only on higher education and 0–2 nursery phases. Note higher education may refer to college and faculty in some cases, as well as school (e.g. medical school). Delivery as part of teacher training in HE settings to be excluded, although teacher training in schools would be relevant.</p> <p><i>Include</i> where school is a major setting of intervention, e.g. school-home interventions.</p> <p><i>Exclude</i> reviews where minority of included studies are in school settings.</p> <p><i>Include</i> preschool, further education, mainstream, independent, alternative and specialist settings.</p> <p><i>Exclude</i> very particular educational settings like hospital schools or home education.</p>
Participants	<p><i>Include</i> where participants are any school stakeholders who may be involved in an intervention and/or providing data about its implementation. Note school stakeholders could be practitioners and therapists who deliver in schools.</p>
Intervention	<p><i>Include</i> any school-based intervention aiming to improve any pupil outcomes about which implementation is assessed or explored.</p> <p><i>Include</i>, as an alternative, where the intervention being assessed is an implementation strategy or tool aiming to improve the setting's implementation outcomes. This may occur outside of the context of a school-based intervention, e.g. views on implementation strategies are sought from school stakeholders. Note implementation strategy aiming to improve implementation outcomes, not strategies that are part of the intervention aiming to improve pupil outcomes.</p> <p><i>Exclude</i> discussion of implementation factors where these are not explored or assessed in relation to a school-based intervention or implementation outcomes.</p> <p><i>Exclude</i> where focus is on an area of need (e.g. mental health) rather than interventions to address the need.</p>
Measures and outcomes	<p><i>Include</i> if studies measure or evaluate a school implementation factor, process, or strategy and indicate the impact, e.g. barrier or facilitator to implementation or pupil outcomes.</p> <p><i>Include</i> where implementation outcomes are considered in relation to factors, strategies or in interaction with pupil outcomes (for example whether increased fidelity improves attainment).</p> <p><i>Exclude</i> school-based intervention evaluations reporting pupil outcomes without any measure of implementation factor, process, strategy or outcome.</p> <p><i>Exclude</i> school-based intervention evaluations reporting implementation outcomes without any consideration of how implementation factors impact the outcomes or how implementation outcomes impact pupil outcomes (for example exclude fidelity measured for an intervention with no analysis of this in relation to pupil outcomes or what factors caused the level of fidelity).</p> <p><i>Include</i> quantitative and qualitative outcomes, so may be objective measures of implementation outcomes or more subjective perceptions of participants about how implementation factors may impact on outcomes.</p>
Language	<p><i>Include</i> papers written in English language only.</p>
Dates	<p><i>Include</i> any study date. Note that some interventions may change over time and publication data will be considered as part of relevance criteria below.</p>
Relevance	<p><i>Include</i> studies that have relevance to contemporary education in England. For example, exclude public health interventions in low and middle income countries and computing interventions pre-2000 which hold less relevance to English schools. Relevance can be low in terms of some combination of date of study, school context/system, and type of intervention</p>

Search strategy for identification of studies

We searched the education databases ERIC, Education Research Complete, British Education Index (via EBSCOhost) and the databases EMBASE, MEDLINE and PsycINFO (via OvidSp) and Social Science Citation Index (via Web of Science) using terms relating to (1) implementation, (2) implementation outcomes (e.g. fidelity, acceptability, adherence and sustainability (Proctor et al., 2011), (3) terms for education 3–18 settings, (4) a range of terms relating to implementation strategies and specific factors identified in the WP1 system map, and (5) process evaluations. We searched for studies that used a combination of these terms in keywords, titles and abstracts combining both term sets 2, 3, 5 and 1–4. A search strategy as used for the database Psycinfo is in Appendix 12.

Search hits were exported to Endnote software and de-duplicated. We then used EPPI-Reviewer software for study selection and data extraction, as it has an 'EPPI-Mapper' tool for the creation of visual evidence maps.

Selection of studies

Study selection involved separate stages of title and abstract screening and then full text screening in line with the inclusion criteria presented above. It was completed by one reviewer (DM, SBC, RP, HG) after an intensive piloting phase for each round of screening. For title and abstract screening all four reviewers piloted 267 records and discussed any disagreements (n=47). For full text screening, we piloted 33 full texts, deliberately including a range of different types of study. All four reviewers met to discuss their decision making to achieve consensus in these and future decisions. This helped to align decisions and interpretation of inclusion criteria. Inclusion criteria were refined to ensure clarity and increase agreement. For full text screening, reviewers were able to refer any decisions to a second reviewer to aid consistency in decision making. Results of this study selection process were documented using a PRISMA style flow chart, which is shown at the beginning of the findings section.

Data extraction and management

Data extraction for an evidence map focuses on a limited number of study and intervention characteristics and therefore involves a yes/no decision on whether the review includes information about a particular category from the evidence map. For Evidence Map 1 this included categorising whether the included review fits criteria in relation to school phase, intervention, outcome, or includes data in relation to the implementation factors.

The Evidence Map 1 dimensions on which these data extraction decisions were made include the following broad categories:

- school phase—specifying a particular age group or all;
- intervention category—indicating whether reviews focused on a particular type of intervention or whole-school versus targeted approaches; here and elsewhere reviews that took a broad focus would have multiple categories selected;
- intervention outcomes—the often pupil outcomes that the intervention aimed to improve;
- implementation outcomes—largely from Proctor et al. (2011) with adaptability added and implementation cost categorised under economic; and
- implementation factors—a wide range of factors indicated as important to school implementation in the WP1 system map, as well as a category for considering of implementation strategies (i.e., methods or techniques that are used to facilitate the uptake, use, and sustainment of interventions).

Table 17 shows all the categories of the Evidence Map 1 in table format.

Table 17: Evidence map framework for data extraction

Intervention context Evidence Map rows	Implementation Evidence Map columns	School Phase Evidence Map cells
Intervention Category <ul style="list-style-type: none"> • Physical Health • Mental Health • Teaching and Learning • Behaviour • Whole School Approach • Targeted 	Implementation Outcomes <ul style="list-style-type: none"> • Fidelity • Acceptability • Adoption • Appropriateness • Feasibility • Penetration 	<ul style="list-style-type: none"> • Early Years • Primary • 11-18 years • All

Pupil Outcomes <ul style="list-style-type: none"> • Attainment • Physical Health • Mental Health • Behaviour • Speech/language 	<ul style="list-style-type: none"> • Sustainability • Adaptability • Economic Implementation Factors <ul style="list-style-type: none"> • Leadership • School climate and community • Readiness • Intervention supported by evidence • Intervention well specified • Intervention fit • Intervention adaptation • Professional development • Implementation teams • Implementation roles • Buy in • Planning • Staff capabilities • Staff capacity (time) • Communication • Assessment, monitoring and data • Implementation support • Incentives • De-implementation • Scaling up • Funding • Resources for intervention • External support • Other implementation strategies 	
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Pupil outcomes are positioned as a subset of intervention context on this evidence map because we are not interested in pupil outcomes for types of interventions alone, the review is interested in how implementation outcomes and factors relate to pupil outcomes.

Given that the data extraction against these dimensions is the data used to generate the map, accuracy is important. We piloted this data extraction on 18 included reviews, DM checked extraction by SBC. This also helped to define the categories used in the data extraction as well as compare and discuss reviewers' decisions. Criteria used to assess whether a study could be indicated as including evidence related to each variable is in Appendix 13.

Evidence Map 2 displays those studies that were included in WP4 and therefore contributed to our realist synthesis and evaluation of implementation strategies. Because of time constraints we were not able to display all 759 reviews and empirical articles in an updated version of Evidence Map 1. Instead, it was more fitting to extract data and display those studies that have contributed to further synthesis in WP4. Compared to the first evidence map, the second evidence map goes further by indicating individual implementation strategies that we analysed in WP4 and categorising studies by design, country, and quality.

The Evidence Map 2 dimensions on which these data extraction decisions were made include the following broad categories:

- school phase—specifying a particular age group or multiple;
- intervention category—indicating whether papers focused on a particular type of intervention or whole school versus targeted approaches; here and elsewhere papers that took a broad focus would have multiple categories selected;
- design—whether papers involved reviews or any of a range of primary research designs;
- outcomes—whether studies report on any of intervention outcomes (often pupil outcomes) or implementation outcomes from Proctor et al. (2011);

- country—whether papers were conducted in several specific countries, globally (often the case in reviews) or in other countries less frequently represented;
- programme theory contexts—whether papers provide evidence for any of the three broad contexts forwarded in WP4;
- programme theory mechanisms—whether papers provide evidence for any of the three broad mechanisms; and
- implementation strategies—whether papers provide evidence related to any of the 32 implementation strategies analysed in WP4.

Appendix 14 shows all the categories of the Evidence Map 2 in table format and criteria to assess this where relevant.

Evidence map findings

Included studies

Detail of included studies are presented with reviews and empirical studies noted separately, given that the first evidence map includes the 57 reviews that met inclusion criteria.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram in Figure 4 summarises the process of study selection for Work Package 3. Initial database searching gave 5,231 records to title and abstract screen. Through title and abstract screening, we excluded 3,078. At this point we decided to have one reviewer perform full text screening given the 2,169 records to full text screen. Through full text screening we excluded 1,410 of these records to leave 759 included studies, made up of 57 reviews and 702 empirical studies. The most frequent reasons for excluding studies at full text screening were study design, relevance to education in England, and outcomes lacking focus on implementation factors. Thirty studies were excluded at full text screening because we could not locate full texts.

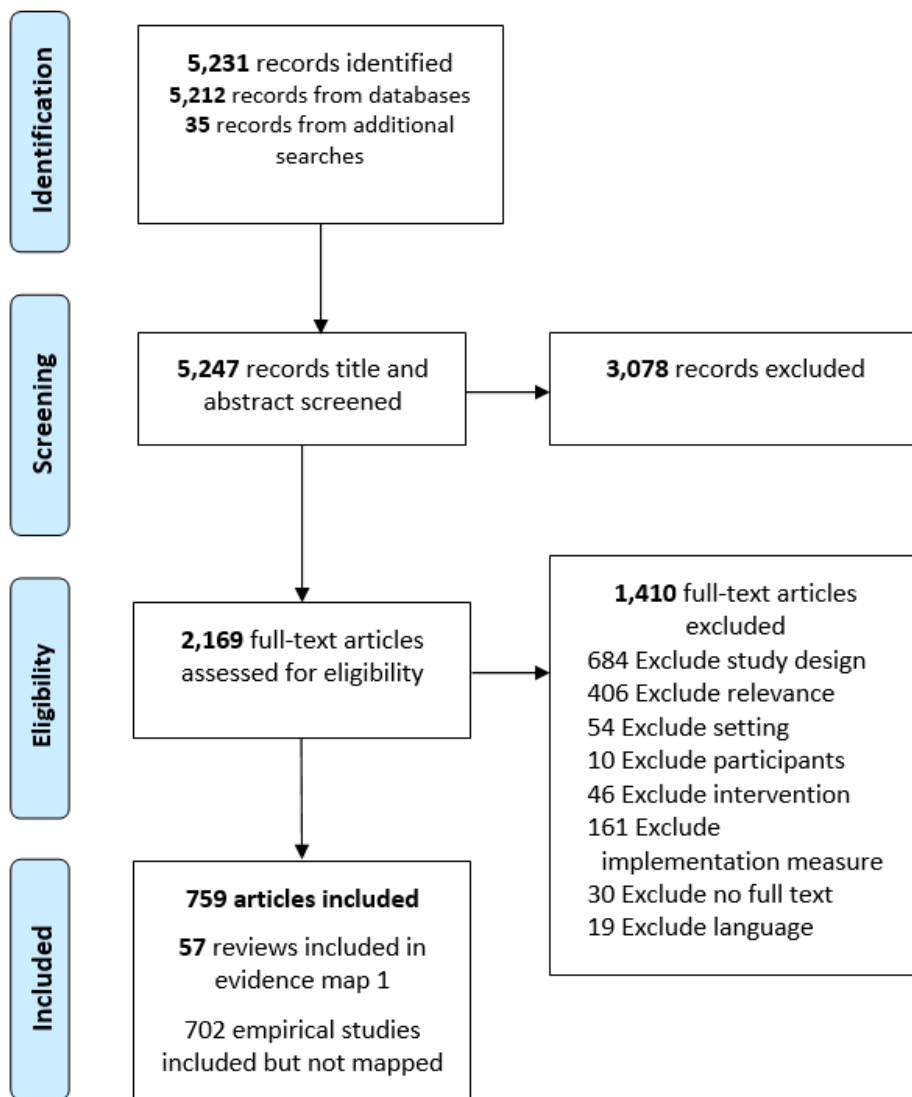
Synthesis

Evidence maps should give user-friendly summaries of included studies (Snijlsteit et al., 2016). We present the evidence maps as bubble plots, using EPPI-Mapper. A benefit of EPPI-Mapper is it allows viewers to see details of included studies (by selecting 'view records' or clicking a bubble).

Evidence Map 1

To view the evidence map online use the following link: <https://eppi.ioe.ac.uk/cms/Portals/35/Maps/WP3Map1.html>

Figure 4. PRISMA flow diagram showing study selection process for Work Package 3

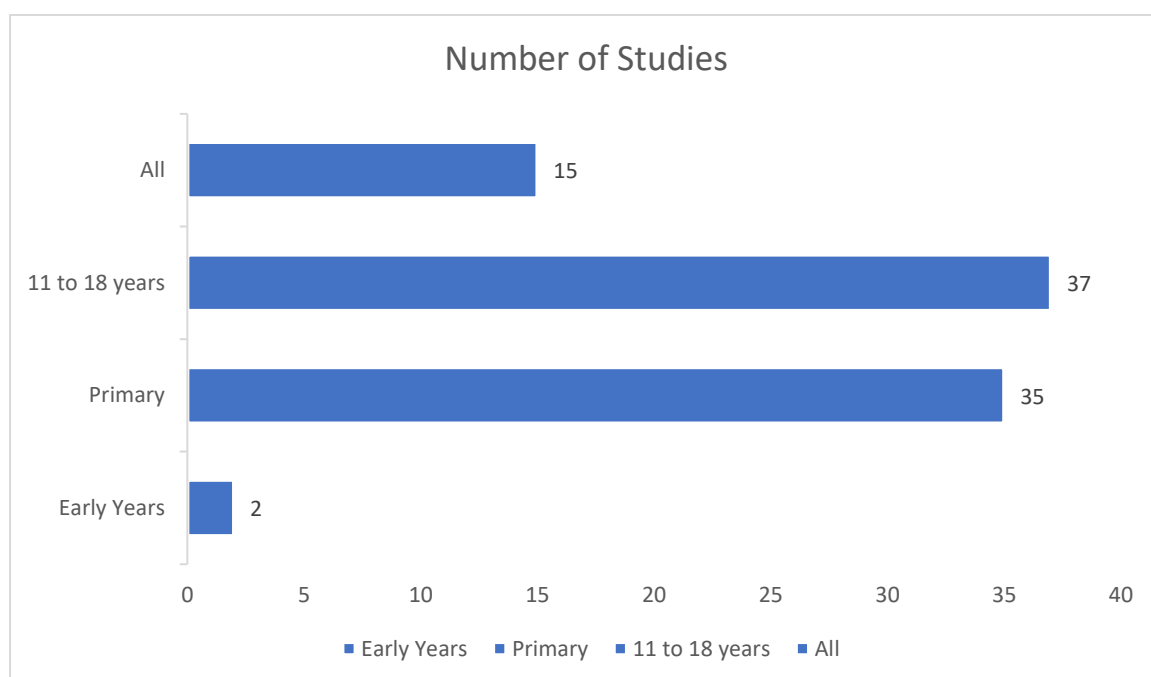


Synthesis of included studies

As indicated in Figure 4, for Evidence Map 1 we included reviews (n=57). The reviews included a variety of review formats including systematic and scoping reviews. We categorised whether the included review fits criteria in relation to school phase, intervention, outcome, or includes data in relation to the implementation factors.

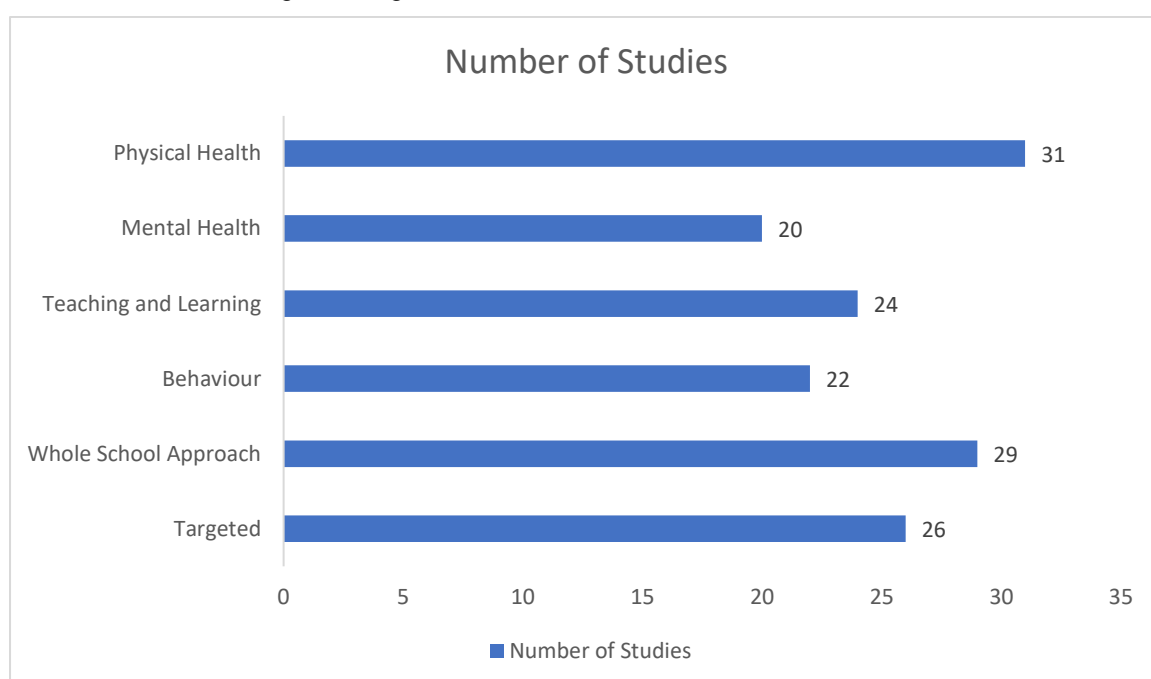
School phase

The majority of reviews were either in primary (n=35) or settings with young people between 11 to 18 years old (n=37), which includes secondary schools, sixth forms, and FE colleges. Here and elsewhere reviews that took a broad focus would have multiple categories selected.



Intervention category

'Intervention category' indicates whether reviews focused on a particular type of intervention or whole-school versus targeted approaches. This chart indicates a broadly similar number of reviews for each category. Note the same study can be in different categories, e.g. whole school behaviour.



Implementation outcomes

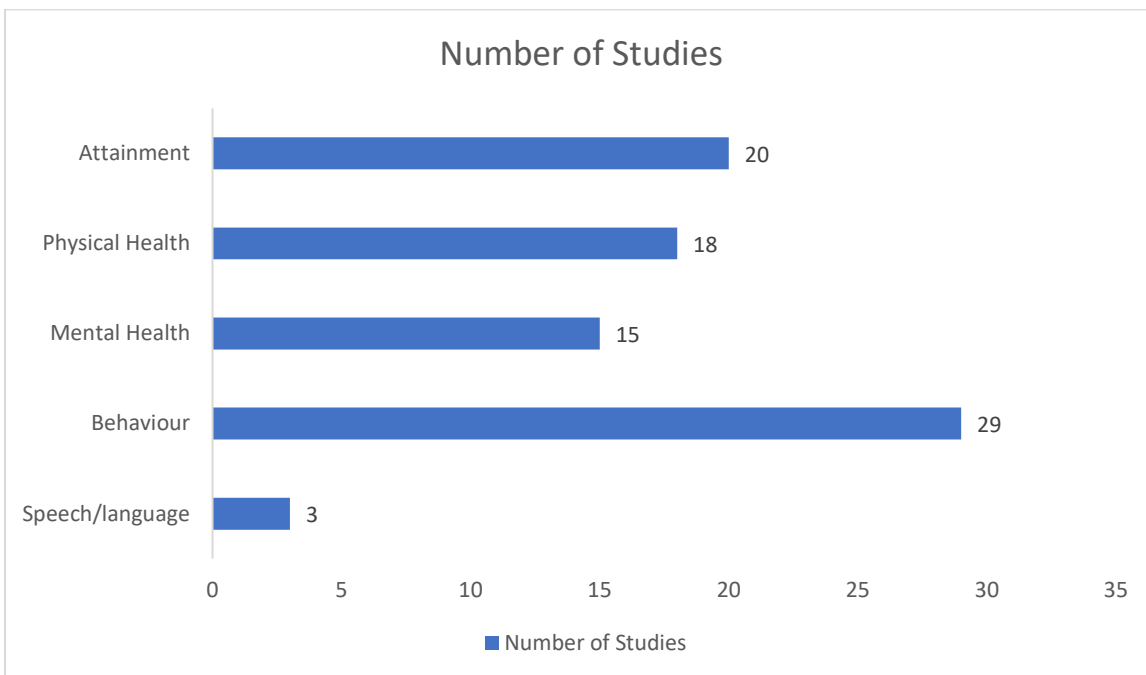
These categories are largely from Proctor et al. (2011) with adaptability added and implementation cost categorised under 'economic'. The most frequent implementation outcome reported in reviews were fidelity (n=36), adoption (n=29), and sustainability (n=22) with appropriateness (n=8), feasibility (n=5), and economic (5) the least frequent.

Implementation Outcomes	
	Number of studies
Fidelity	36
Adoption	29

Sustainability	22
Acceptability	20
Adaptability	16
Penetration	11
Appropriateness	8
Feasibility	5
Economic	5

Pupil outcomes

We categorised the pupil outcomes that the intervention aimed to improve in each review. Behaviour was the most frequently measured pupil outcome (n=29) and speech/language the least frequent (n=3).



Implementation factors

We categorised a wide range of factors indicated as important to school implementation in the WP1 system map, as well as consideration of implementation strategies (i.e., methods or techniques that are used to facilitate the uptake, use, and sustainment of interventions). Here, most factors had over 20 reviews reporting evidence for their relevance with intervention fit (n=49), professional development (n=48), and buy-in (n=47) being the most frequent factors mentioned in the majority of reviews; incentives (n=9), scaling-up (n=2), and de-implementation (n=1) were the least frequent. Scaling-up and de-implementation low frequencies highlight important areas for research focus. It is interesting that the factor intervention supported by evidence is also a relatively low frequency (n=15) when evidence could be seen as integral to the most frequently mentioned factors (intervention fit, professional development, and buy-in).

	Number of studies
Intervention fit	49
Professional Development	48
Buy-in	47
Communication	44
Staff capabilities	39
Resources for intervention	38

External support	37
Other Implementation strategies	37
Intervention well specified	36
Staff capacity (time)	36
Leadership	34
Assessment, monitoring and data	34
School climate and community	32
Implementation Support	31
Planning	30
Implementation Teams	29
Intervention adaptation	28
Funding	22
Implementation roles	21
Readiness	16
Intervention supported by evidence	15
Incentives	9
Scaling-up	2
De-implementation	1

Summary of Evidence Map 1

Evidence Map 1 shows review findings which address or mention categories or take an intervention or outcome focus. Most reviews cover multiple implementation factors and outcomes. Drawing on our evidence map of the 57 reviews that met our inclusion criteria indicates that most reviews focused on primary and/or secondary age groups with a few in early years and few that took a focus on any age groups. In early years, behaviour-targeted interventions and professional development have the highest concentration of synthesised evidence with eight studies.

All the categories of implementation factors are represented. Leadership, Professional Development, Implementation Teams, Staff Motivation, Staff Capability, Intervention Related, Resources, and Outer Context are most often covered. However, there are implementation factors for which we found no synthesised research evidence in relation to particular interventions, such as school readiness and time factors in mental health category interventions as well as assessment and monitoring factors in teaching and learning category interventions. Implementation factors tended to feature more often in included reviews than implementation outcomes. The implementation outcomes that were most often evidenced were fidelity and acceptability, particularly for targeted and behaviour intervention categories and behaviour pupil outcome. There was less evidence in relation to feasibility, sustainability, and adaptability.

There are some empty cells where the reviews do not provide evidence across categories. This tended to be seen in relation to mental health interventions, mental health, and speech and language pupil outcomes, appropriateness as an implementation outcome, and assessment and monitoring as an implementation factor. Given the importance of implementation factors such as assessment and monitoring, time, planning, fidelity, and communication it is noteworthy these have limited synthesised evidence. Lastly, implementation strategies are also weakly evidenced by the reviews. This may reflect that implementation strategies specifically for school settings is a relatively recent topic of research (Cook et al., 2019).

The limitations of this evidence map include that it does not assess the quality of evidence or reflect evidence from studies which were not included in the 57 reviews. We have therefore quality appraised the reviews and empirical

studies included in WP4 and hence displayed in Evidence Map 2. Future research should respond to any of the important evidence gaps seen in reviews to date.

Evidence Map 2

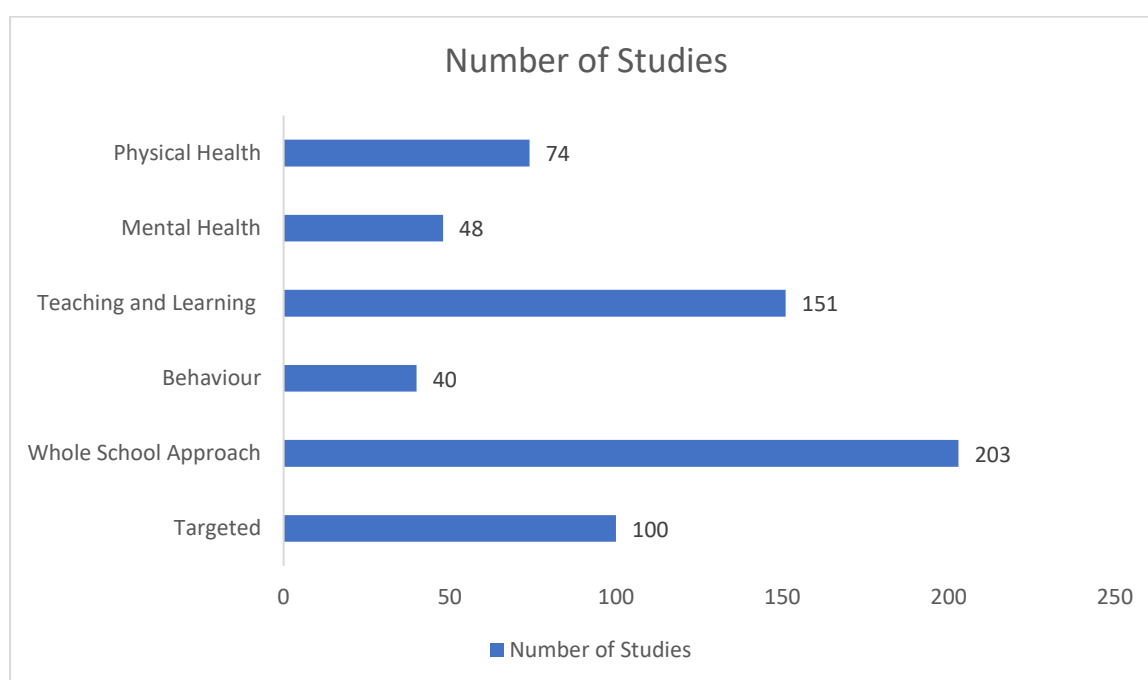
To view the evidence map online use the following link: <https://eppi.ioe.ac.uk/cms/Portals/35/Maps/WP3Map2.html>

Synthesis of included studies

Evidence Map 2 displays those studies that were included in WP4 and therefore contributed to our realist synthesis and evaluation of implementation strategies. Because of time constraints we were not able to display all 759 reviews and empirical articles in an updated version of Evidence Map 1. Instead, it was more useful alongside our work on WP4 to extract data and display those studies that have contributed to its synthesis. Compared to the first evidence map, the second goes further by indicating individual implementation strategies that we analysed in WP4 and categorising studies by design, country, and quality.

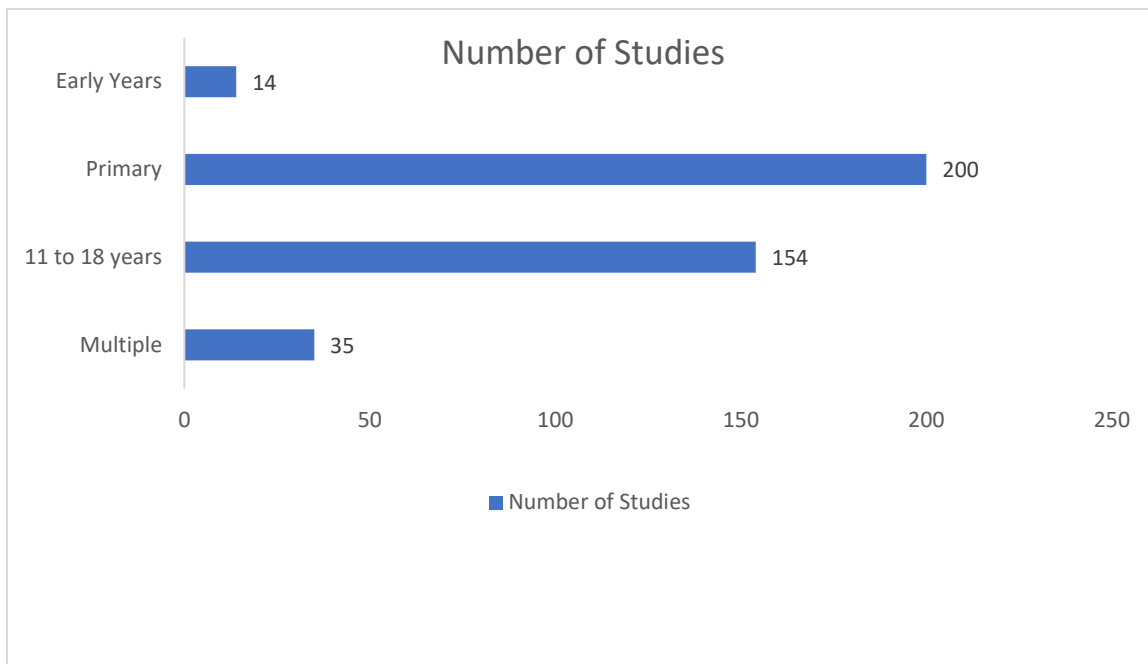
Intervention

'Intervention' indicated whether studies focused on a particular type of intervention or whole-school versus targeted approaches. Studies were coded as physical health, mental health, etc. as relevant. Here and elsewhere papers that took a broad focus would have multiple categories selected. From the chart we can see that whole-school approaches (n=203) were more frequent than targeted approaches (n=100) although some reviews were both (n=9). It is perhaps unsurprising that teaching and learning (n=151) were the most frequent type of intervention due to its broad scope, which include subject-specific, literacy, SEN, and pedagogical interventions.



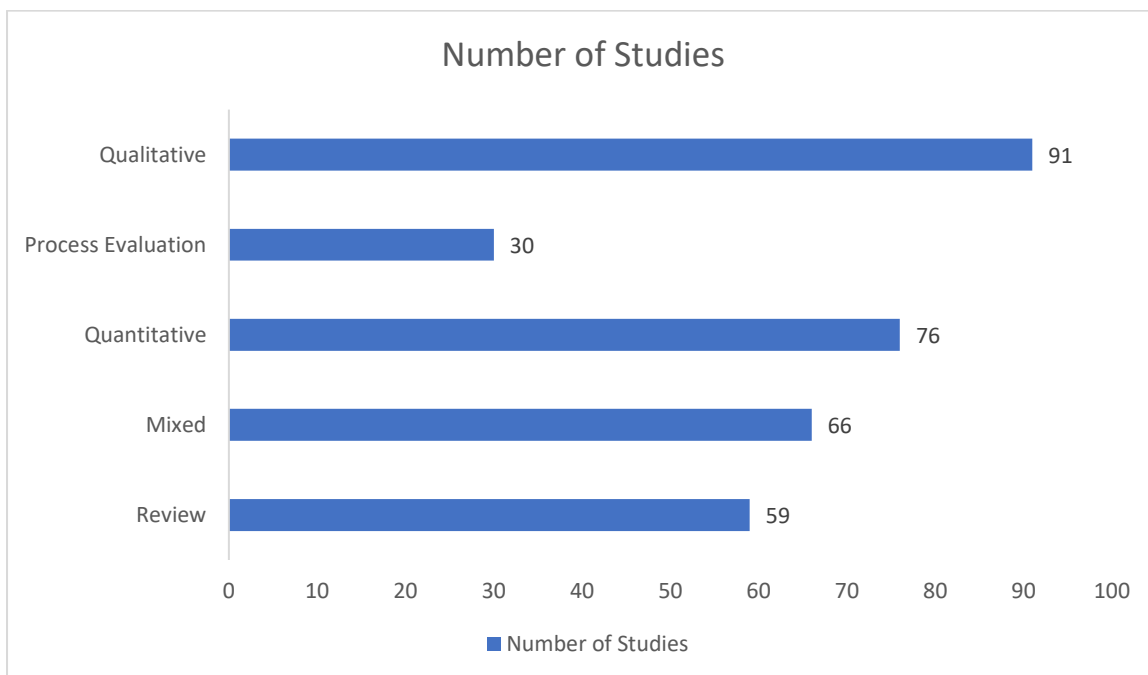
Phase

This category specified a particular age group with those studies that have two or more age groups having multiple categories selected. As for Evidence Map 1, the majority of studies were either primary (n=200) or settings with young people between 11 to 18 years old (n=154)



Design

Our design category indicates whether studies were reviews or any of a range of primary research designs. Some designs could overlap, such as 'process evaluation', with an overall design whereas 'mixed' would not also be categorised as qualitative and quantitative. The spread of design was broad with qualitative design the most frequent (n=91) and process evaluation the least frequent (n=30).



Outcomes

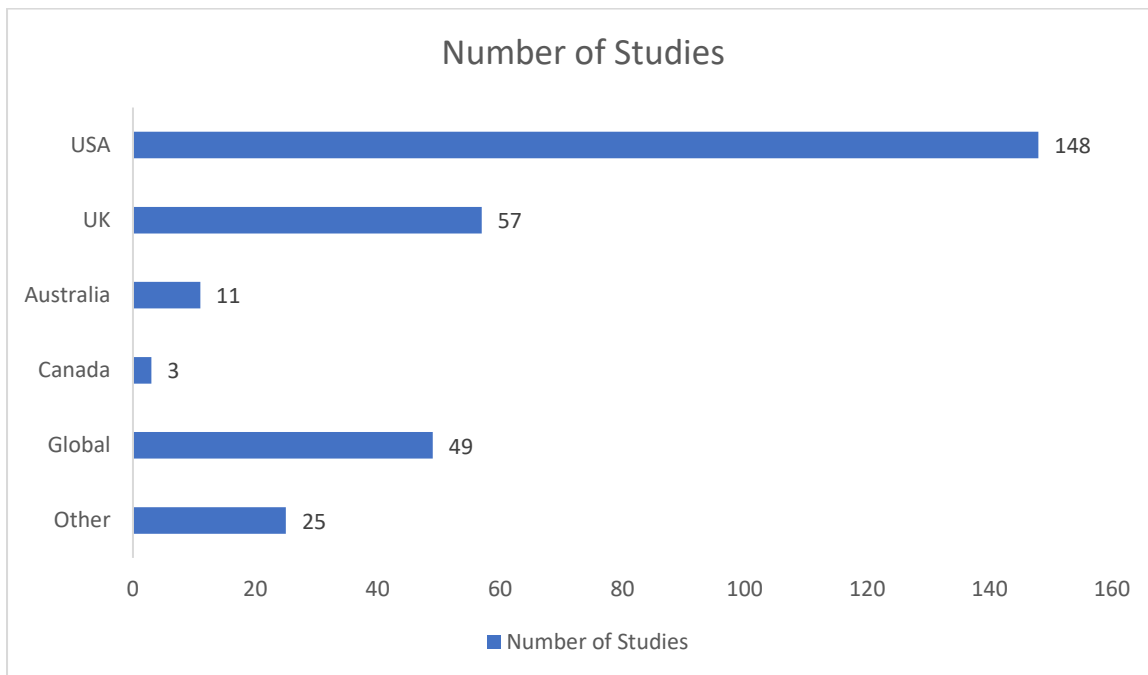
'Outcomes' categorised whether studies report on any of intervention outcomes (often pupil outcomes) or implementation outcomes from Proctor et al. (2011). Fidelity (n=149), acceptability (n=140), and adoption (n=139) where the most frequent; appropriateness (n=76), cost (n=62), and penetration (n=36) the least frequent.

Outcomes	Number of studies
Fidelity	149
Acceptability	140
Adoption	139

Feasibility	89
Sustainability	83
Appropriateness	76
Cost	62
Penetration	36
Intervention	102

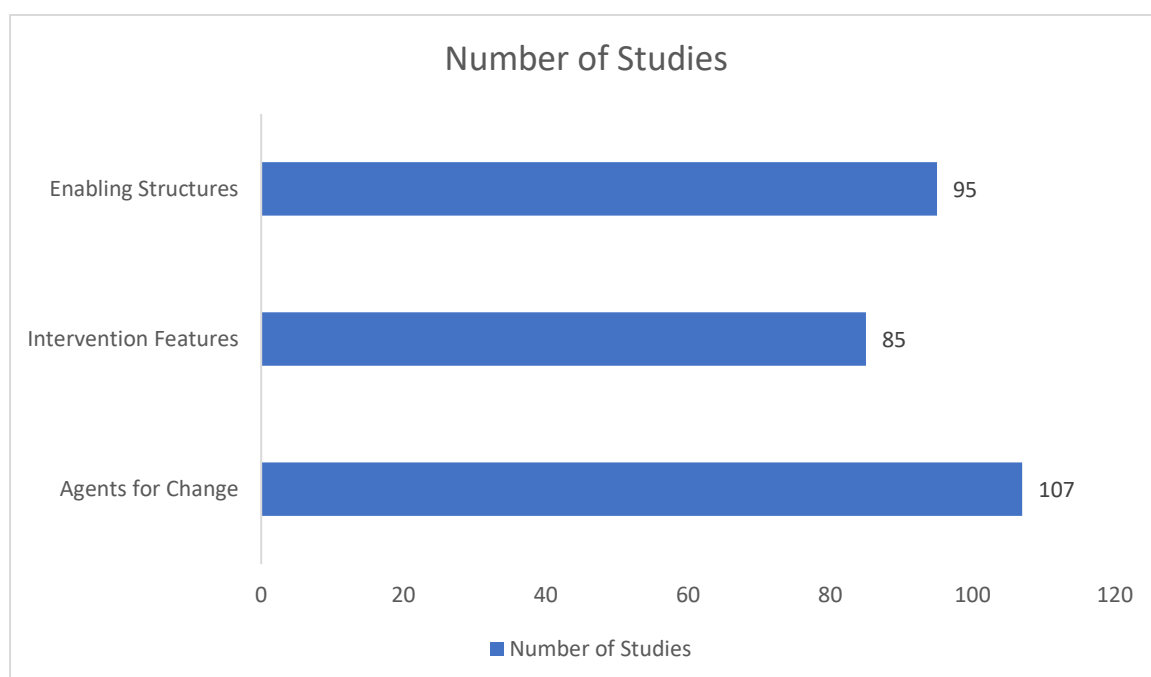
Country

'Country' denotes whether studies were conducted in several specific countries, globally, or in other countries. The global category (n=49) indicates international reviews or primary studies spanning several countries. Studies were most frequently conducted in the U.S.A. (n=148) with the UK being the second most frequent (n=57) with Canada (n=3) and Australia (n=11) the least frequent.



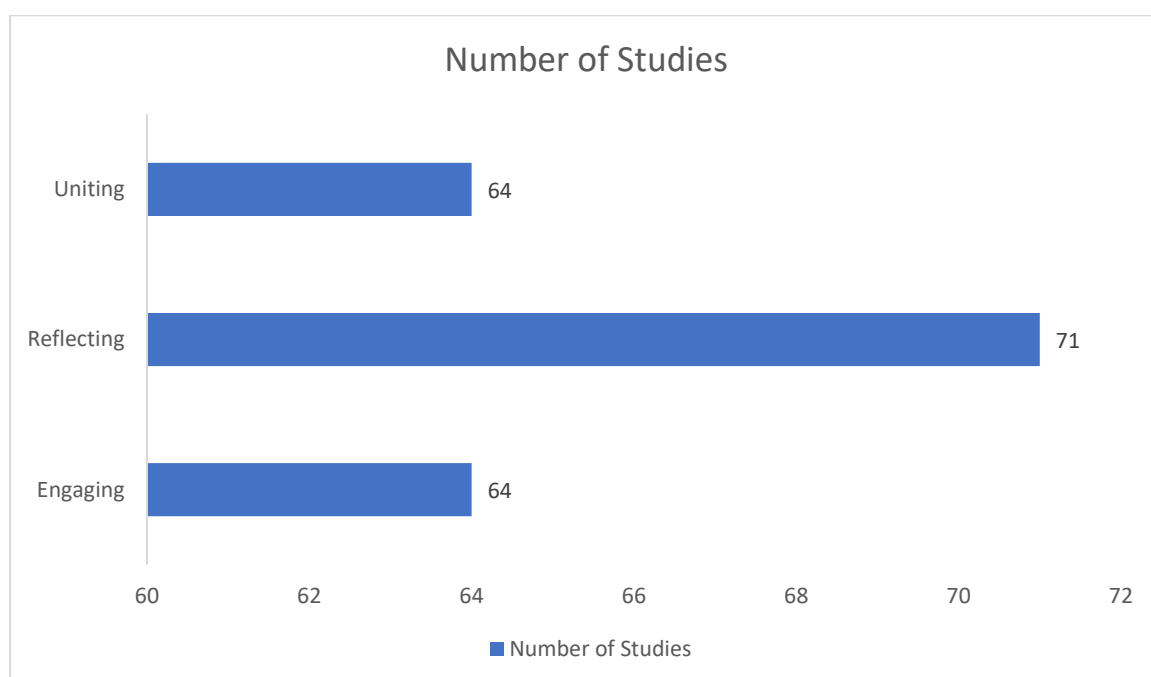
Programme theory contexts

This highlights whether studies provide evidence for any of the three contexts forwarded as part of the revised programme theory in WP4. Studies can evidence one or more contexts, 207 studies evidenced at least one.



Programme theory mechanisms

This chart highlights whether studies provide evidence for any of the three broad mechanisms in WP4; 154 studies contribute evidence to at least one of the mechanisms.



Implementation strategies

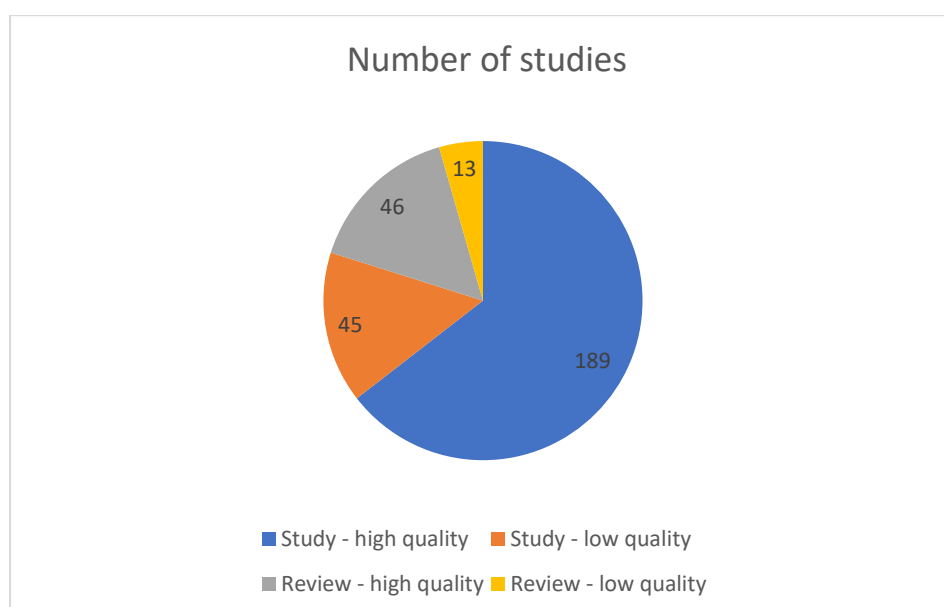
We also categorised whether studies provide evidence related to any of the 34 implementation strategies (or pairs of closely aligned strategies) analysed in WP4. Each strategy number relates to the numbering in Cook et al. (2019). The most frequent strategy evidenced in the literature was 57: 'Involve students, family members, and other staff' (n=42). 51: 'Improve implementers' buy-in' was the next most frequently evidenced strategy (n=29). Most of the other strategies are evidenced by 10–24 studies with the remaining two studies, 60: Access new funding (n=9) and 46: Use train-the-trainer strategies (n=7) the least frequently evidenced.

Implementation strategies	Number of studies
57. Involve students, family members, and other staff	42
51. Improve implementers' buy-in	29
5. Develop a detailed implementation plan or blueprint	24

6. Develop and organise quality monitoring system	24
39. Conduct ongoing training and 44. Provide ongoing consultation/coaching	20
23. Conduct local consensus discussions	19
32. Organise school personnel implementation team meetings	19
26. Identify and prepare champions	18
1. Assess for readiness and identify barriers and facilitators	17
16. Promote adaptability	17
4. Conduct local needs assessment	16
14. Provide practice-specific supervision and 30. Model and simulate change	16
34. Recruit, designate, and train for leadership	16
38. Conduct educational outreach visits	16
45. Shadow other experts	16
53. Remind school personnel	16
18. Test-drive and select practices	15
48. Create new practice teams	15
50. Facilitate relay of intervention fidelity and student data to school personnel	15
12. Facilitation/problem-solving	14
17. Tailor implementation strategies	14
41. Develop educational materials and 42. Distribute educational materials	14
43. Make training dynamic	14
68. Change/alter environment	14
22. Capture and share local knowledge	13
61. Alter and provide individual- and system-level incentives	13
8. Obtain and use student and family feedback	12
54. Targeting/improving implementer well-being	12
74. Pruning competing initiatives	12
7. Develop instruments to monitor and evaluate core components of the innovation/new practice	11
10. Stage implementation scale-up	11
28. Inform local opinion leaders	10
60. Access new funding	9
46. Use train-the-trainer strategies	7

Quality:

We appraised the included empirical studies using the Mixed-methods Appraisal Tool (MMAT, V.2018) and the quality of included reviews using A Measurement Tool to Assess Systematic Reviews-2 (AMSTAR 2). This chart presents ratings categorised as high and low quality. The majority of both the empirical studies (n=189) and reviews (n=46) were rated as high quality.



Chapter 5. Work Package 4

Work Package 4 involved a realist review of implementation in schools. It drew on the work described thus far in the report, specifically the relevant searches for literature and the system map. An initial programme theory was derived from both the system map and key factors and outcomes related to implementation in schools from other work packages. The methods and findings described here represent the theory refinement stage of a realist review as they build on previous work packages and consultation with the guidance report panel. Work Package 4 then takes a refined programme theory a stage further by considering how it can be used to explain implementation strategies that themselves have some evidence of impact when used in schools. The realist review explains evidence in relation to implementation in schools with focus on the contexts and underlying mechanisms that may lead to a range of improved implementation outcomes, and ultimately pupil outcomes when interventions are introduced in schools.

Review and methodology rationale

Realist reviews

Realist reviews are used to understand how and why complex interventions achieve effects. They are a form of theory-driven research synthesis with origins in scientific realism that is concerned not only with whether an approach (i.e., intervention, policy, programme, or practice) is effective in improving intended outcomes, but with how it works, for whom, in what conditions, and why. Central to this approach is the idea that interventions undertaken in complex systems, like schools, are underpinned in design and functioning by explicit or implicit theories comprising assumptions about ways effects occur. As an unadopted or poorly implemented intervention is unlikely to produce its intended effects, theories of effectiveness need to extend to how and why interventions are successfully introduced, accepted, adopted, integrated, and embedded in existing teams, processes, and organisations—i.e. implementation. Therefore, an initial step is to develop a programme theory that can be refined through analysis of evidence from relevant literature.

The realist review and process of iterating a programme theory is interested in developing and testing how *mechanisms* lead to *outcomes* in particular *contexts*. This contextually bound approach to causality is represented as context + mechanism = outcome. CMO configurations (CMOCs) constitute the analytical units of realist inquiries. The CMO configuration is a heuristic used in a realist synthesis to generate causal statements that link mechanisms with aspects of context and outcomes.

Mechanisms can be defined as ‘the underlying entities, processes or social structures that are triggered by an intervention being introduced impacting context’ (Astbury and Leeuw, 2010, p.368). This is broader than some realist definitions of mechanisms as how a programme’s resources or opportunities interact with the reasoning of individuals and lead to changes in behaviour (e.g. Pearson et al., 2015). We use the broader definition given the focus on a wide range of actors collectively involved in implementation in schools and how implementation of new interventions has the potential to change the systems (schools and beyond) that these individuals are part of. Context, in turn, captures conditions occurring before, or existing outside of, implementation actions with the potential to activate the mechanisms during implementation. Contexts are not generic properties of the school system or the intervention itself, they are conditions or factors that are causally relevant to mechanisms. Therefore, it is most helpful to consider context as relational and dynamic features that shape mechanisms (Greenhalgh and Manzano, 2021). This appreciates that context operates in a dynamic and emergent way over time in schools as systems (Coldwell, 2019). Understanding the interaction between context and mechanism is key to explaining how and why implementation works.

In our analysis of implementation strategies to further refine the programme theory, we drew upon Mukumbang et al.’s (2018) ICAMO configuration (intervention – context – actor – mechanism – outcome). ICAMO configurations allow for more specific, practical examples of a programme theory. The ‘I’ in our analysis was implementation strategy, a condition in which the contexts, mechanisms, and outcomes interact. This configuration also helps the realist analysis consider what works *for whom*, as it specifies relevant actors in relation to the strategy, context, and mechanism.

A realist review methodology suits the purpose of the current review because the focus is on explanation rather than judgement, i.e. realist reviews explain why implementation is effective, rather than only the extent to which it is effective. Realist reviews also acknowledge the complexity of the intervention and the system into which it is introduced. As a result, it lends itself to informing guidance on how to improve intervention implementation because ‘it seeks to unpack the mechanism of how complex programmes work (or why they fail) in particular contexts and settings’ (Pawson et al., 2005, p.21). The realist methodology also allows researchers to synthesise quantitative and qualitative evidence together so that both the processes and outcomes of implementation may be investigated (Pawson et al., 2005). Realist reviews learn from, rather than control for, real-world phenomena that will be important in school settings such as diversity, change, adaptation, and why interventions may not work. By taking a programme theory as its unit of analysis, a realist review has the potential to maximise learning across policy and organisational boundaries (Pawson et al., 2005).

We used the RAMESES publication standards (Realist And MEta-narrative Evidence Syntheses: Evolving Standards) in reporting our realist review. These standards are based on an evaluation of 35 realist reviews (Wong et al., 2013). The standards outline best practice for reporting a realist review and a framework for others to assess rigour and quality of the review method. The RAMESES publication standards do not provide detailed guidance for how to conduct a realist review. The 'evolving' nature of the standards reflects the fact that this methodology is relatively new and constantly developing, as such there is not a definitive set of steps that guarantee a robust realist review. Rather, it requires a series of judgements about the relevance and robustness of evidence for the purposes of answering a specific question.

Considering this guidance and considering the necessary flexibility and freedoms of the Realist approach (Marchal et al., 2012), our review includes the five steps for review outlined by Kantilal et al. (2020) as follows: (1) define the review scope, (2) develop initial programme theory, (3) search for evidence, (4) select and appraise evidence, and (5) extract and synthesise data.

How this realist review builds on previous work packages

Realist theory development work has already taken place through Work Packages 1–3 and therefore much of the work that would typically be included in the first part of a realist review has been completed. The findings from these work packages and how they informed the realist review theory development are outlined below. Full findings have been reported in previous chapters.

Work Package 1

As part of Work Package 1 we undertook systematic searches for evidence describing the application of implementation theories, models, or frameworks (TMFs) within the school-context. This process of systematic searching captured 58 theories, models, or frameworks which have been applied in the school context from across 82 empirical or theoretical studies. To build on the evidence and to define scope in terms of what are important factors in relation to implementation in schools, a system map was developed to conceptualise the factors and relationships which play a role in implementation. As the development of the system map was providing the foundation for initial programme theory development, stakeholder engagement through the guidance report panel ensured that the realist theory development work remains close to policy and practice (Saul et al., 2013).

The [System map](#) provides a mid-range theory (expected to be applicable across different settings) from which to develop an initial realist programme theory. It is not a realist programme theory as it does not indicate connections between contexts, mechanisms, and outcomes. The system map highlights key areas of implementation in schools: foundations, intervention related factors, and implementation processes—which can be identified as occurring at a particular stage of implementation such as during initial exploring, preparation, delivery, monitoring, or sustainment. The system map helped to visualise how many implementation processes cut across stages or timeframes, contextual factors, the nature of the intervention and the characteristics of individuals or groups involved.

We had initially anticipated that our realist review initial programme theory would focus on key aspects of the system map rather than cover all areas indicated. However, stakeholder feedback suggested aiming for good coverage of the system map in theorising and synthesising evidence related to implementation in schools was desirable. As such, we developed an initial programme theory that incorporated key determinants, implementation strategies, and implementation phases from the system map to then refine through the synthesis of evidence. The EEF guidance report panel formed to guide this evidence review has provided advice and feedback on the content of the system map that the initial programme theory for this review is based upon. Later the guidance report panel provided feedback on an early version of our refined programme theory. This is an important part of realist synthesis, which often involves high stakeholder involvement and an iterative movement between synthesis of literature and feedback on findings.

Work Package 2

Work Package 2 surveys and interviews have captured school leaders' experiences of implementing approaches in their settings and the barriers and enablers they recognise. This gave reviewers ideas about context that could be explored in the realist review and supported factors from the system map being included in the initial programme theory. Twelve interviews and a further four follow-up interviews were completed. Key findings included:

- simplicity of the approach and consistency of delivery were highlighted as key;
- staff views and buy-in to an intervention, professional development, motivation, and capacity were indicated as factors relevant to fit and readiness for an approach;
- plans for implementation were often working documents and leaders' roles shifted during the implementation process;
- initial delivery of an approach was phased in some cases and sustaining an approach was supported by a range of activities; and

- implementation that has been less successful was attributed to issues around fit of approach to setting, staff buy in, implementation climate, quality of approach, and turnover of key staff.

Interviews indicate support for the premise that although each context is unique, there are regularities to the contextual determinants that support or hinder effective implementation. For instance, we have seen successful implementation occur among schools that adopt a pre-designed intervention as well as those which adopt their own approach to improve outcomes. However, each of these contexts appear to trigger different mechanisms that can improve implementation and intervention outcomes (pre-designed interventions provide increased structure, training, and resources whilst approaches designed in house provide increased fit and feasibility, autonomy and buy-in). Interviews have also highlighted other salient contextual variables at the individual level (i.e. personality, motivation), interpersonal level (relationships, communication, colleague support) and community level (external pressure, financial resources, collaborations). Work Package 2 therefore provided some ideas about contexts that supported and challenged implementation across a variety of examples of implementation. It also indicated the factors that could be ongoing influences on implementation. However, these findings were from a small number of interviews and therefore only provided some ideas that could be substantiated in our realist review focused on evidence from research literature.

Work Package 3

Work Package 3 identified empirical studies and mapped reviews that report on implementation factors and processes when school-based interventions have been explored and evaluated. This includes literature that demonstrate the impact of these factors and processes on implementation outcomes and/or pupil outcomes. We have also located research evaluating whether using specific implementation strategies improves implementation in schools. Fifty-seven reviews of implementation that fit inclusion criteria have populated an initial evidence map to indicate where these reviews have information in relation to: intervention categories, school phase, implementation factors, implementation strategies, implementation outcomes, and intervention outcomes. It has shown that there is evidence for the range of implementation factors that are part of the initial programme theory detailed below. We also located 702 empirical studies relevant to implementation in schools in England that provide information linking implementation factors or strategies to implementation and/or intervention outcomes. This evidence from Work Package 3 was used to refine the programme theory as part of our realist review and then to evaluate the impact of implementation strategies and how the refined programme theory can explain the use of these strategies.

Previous work packages have therefore aided theory development and set the scope of the realist review. In realist reviews, theory is refined by searching for empirical research literature relevant to an initial programme theory. Work Package 3 showed where relevant evidence is available. We also used empirical literature retrieved in Work Package 1 for the realist review because it helped identifying contexts and mechanisms as it explains implementation in schools theoretically. Using relevant literature that has already been retrieved enhances efficiency and reduced the likelihood of finding insufficient evidence to express CMO configurations of relevance to ideas in the initial programme theory. The realist review study selection and supplementary searching conducted for this review focused on locating CMO evidence that is relevant and rigorous. Synthesis of this literature led to a refined programme theory.

Objectives

This realist review helped answer the following overarching research questions.

- **How should school leaders and teachers understand implementation and how should they implement evidence-informed approaches in their context in order to have the best chance of improving all pupils' outcomes?**
- **What is the relationship between content ('what') and process ('how') within school implementation?**

This realist review synthesised relevant research both as part of refining a programme theory and in relation to its application to implementation strategies to provide insight on the following research questions.

- **To what extent do different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation), and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) intervention outcomes?**
- **What is the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?**

There is significant overlap between these research questions and the goal of realist reviews, which are to understand how programmes (implementation actions here) work, for whom, in which contexts, and for which outcomes. Through focus on context we considered the factors that impact implementation in education; mechanisms indicated the actions underlying dimensions, processes and activities; relevant outcomes were anticipated to include both implementation and intervention outcomes. The final research question on the impact of implementation strategies was answered through an additional analysis reviewing implementation strategies and evidence from the realist review in relation to these practical strategies that schools may use and how our refined programme theory can explain their use.

Methodology

This section describes the methodology used for the realist review as part of Work Package 4. The evidence review work on Work Packages 1–3 helped define the review scope to include fields of study such as implementation science, behaviour change, knowledge mobilisation, and school improvement. The prior work packages pinpointed aspects of implementation in schools that are considered important across theoretical literature, guidance report panel experiences and views, and school leaders participating in the Work Package 2 review of practice. This sensitisation to the scope of the review helped to develop an initial programme theory as described below.

A range of terms define and underpin key hallmarks of a realist review. Table 18 defines a number of these as used in this review.

Table 18: Definition of terms used in the review

Term	Definition
Programme Theory	A model linking outcomes to programme (implementation) activities and the underlying theoretical assumptions. A programme theory may consist of multiple CMOCs that explain the context, mechanism and outcome relationships, and the pattern of outcomes. The programme theory is developed and refined over the course of a realist review.
Context	Conditions occurring before, or existing outside of, implementation strategies with the potential to enable or constrain particular mechanisms during implementation.
Mechanism	An underlying entity, process, or social structure that is triggered by context.
Outcome	The impact of the mechanism on the people or school system involved in implementation. Outcomes may relate to implementation, for instance adoption and buy-in, and/or pupil outcomes as part of anticipated intervention outcomes when implemented successfully.
CMOC	Context-mechanism-outcome configuration. Specific interrelationships among context (C), mechanism (M), and outcomes (O) drawn from evidence.
ICAMO	A more focused configuration we used in relation to implementation strategies where evidence is used to specify the relationship between implementation strategies (I), context (C), actors, meaning the people involved (A), mechanism (M), and outcomes (O).
Relevance	Is evidence from a study appropriate for the theoretical idea being refined?
Rigour	Quality of the evidence for the theoretical idea being refined.
Juxtapose	Place multiple pieces of evidence together to suggest a link or contrast between them.
Reconcile	Make two or more conflicting evidence ideas consistent or compatible.
Adjudicate	Make a judgement about quality or applicability of evidence for a particular review finding and select amongst competing ideas.
Consolidate	Bring together into a more coherent whole.
Situate	To place evidence in a context and show the connection between different evidence.

1. Identify initial programme theory

Figure 5 depicts the initial programme theory that informed this realist review and was refined according to the methods outlined below. This initial programme theory sets out key domains derived from the Work Package 1 system map and includes outcomes. This ensured we were confident in our coverage of key concepts, yet also gave practical boundaries within which to focus our synthesis within the timeframe of the project. The system map was not feasible to use as the initial programme theory because it focuses on factors and links between them. While these factors often indicated context for school implementation, the relationships do not necessarily indicate mechanisms and are not linked to

implementation outcomes. Secondly, the level of interaction between groups of factors indicated on the system map would be unfeasible to consider in full during the review, particularly as mechanisms would still need to be theorised to test this.

An initial programme theory was therefore needed that indicated outcomes and a manageable number of relationships across key factors from the system map. This initial programme theory then provided a starting point to analyse relevant literature to identify configurations between contexts, mechanisms, and outcomes. The interactive nature between elements of the school system, the intervention being implemented, and a wide range of implementation actions or strategies from the system map is indicated in this initial programme theory. This flexibility is preferable compared to a fixed number of predetermined CMOCs. This would risk missing the causal connections and potential cumulative effects across different implementation strategies or determinants and fail to cover all aspects of the system map.

Figure 5 indicates the broad interactions between different aspects of school implementation and outcomes. Domains under each of the seven categories from the system map (intervention, explore, prepare, deliver, monitor, sustain, and foundations) are indicated that provide coverage of the factors from the map and tractable terminology to aid identifying relevant literature. The domains helped to identify relevant contexts and mechanisms and allow for links to be seen across domains too. For instance, data about readiness or resources to support school staff in delivery. This meant we did not assume that domains were tied to particular phases of implementation as we refined the initial programme theory. For instance, fit of approach, roles and responsibilities, planning, reflection, and adaptation are all aspects of implementation that are relevant at multiple timepoints during the journey of implementing an intervention in a school.

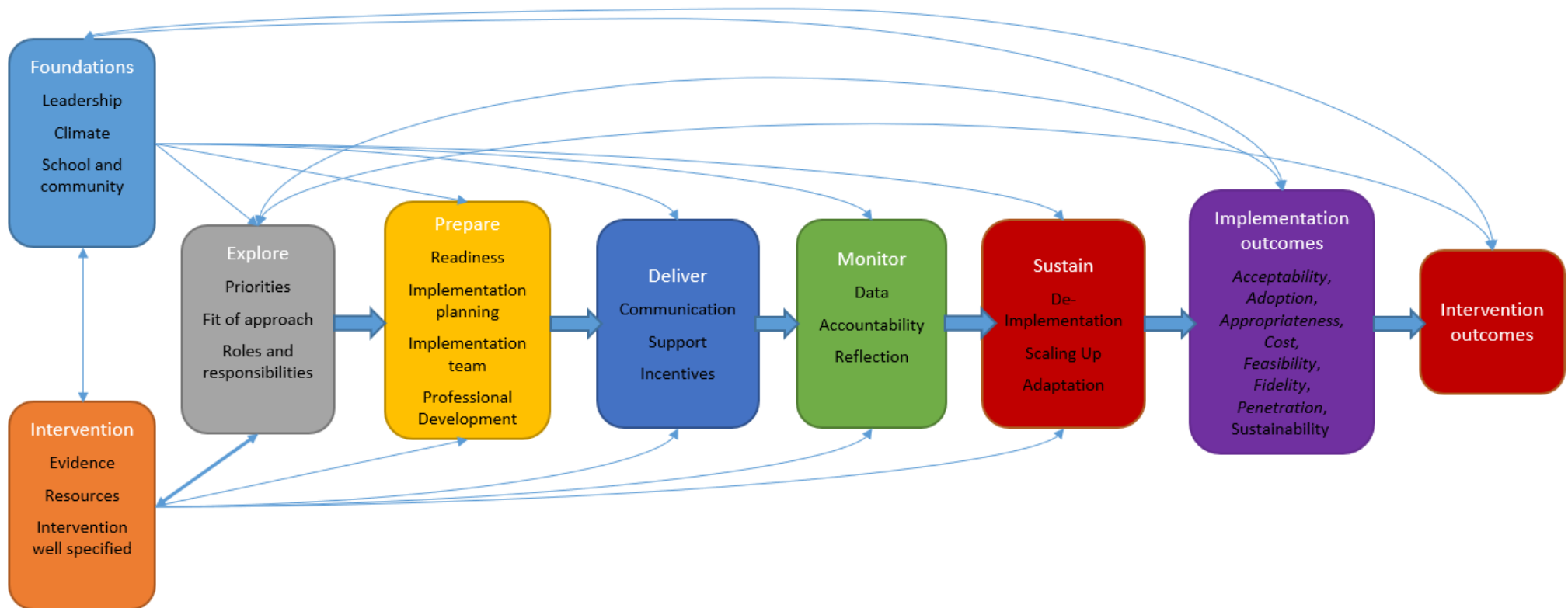


Figure 5: Initial programme theory

Theory refinement methods

The refinement stage elaborated, specified, and tested out the initial programme theory using evidence from reviews and empirical research to substantiate and then challenge a refined programme theory that attempts to help explain what works, for whom, and in what context in relation to implementation of evidence-based action in schools. The following sections outline the review methods that we followed while indicating how this progressed in an iterative manner to interrogate, weigh up evidence for, and challenge the relationships between, context, mechanisms, and outcomes indicated in the refined programme theory we developed.

We follow established realist synthesis quality standards, guidance, and publication guidelines in these steps (Wong et al., 2013). Figure 6 provides an overview of the methodological steps used across this refinement phase of the realist review and how this relates to the system map and informs further review work focused on implementation strategies. It is adapted from similar examples used in realist evaluations (i.e. primary research realist work; e.g. Gilmore et al., 2019); we found it helpful to position the development from initial to more final programme theory as part of a process of steps and demonstrate the iterative nature of working with different categories of literature in a staged approach. Step 1, identifying an initial programme theory, has been described above.

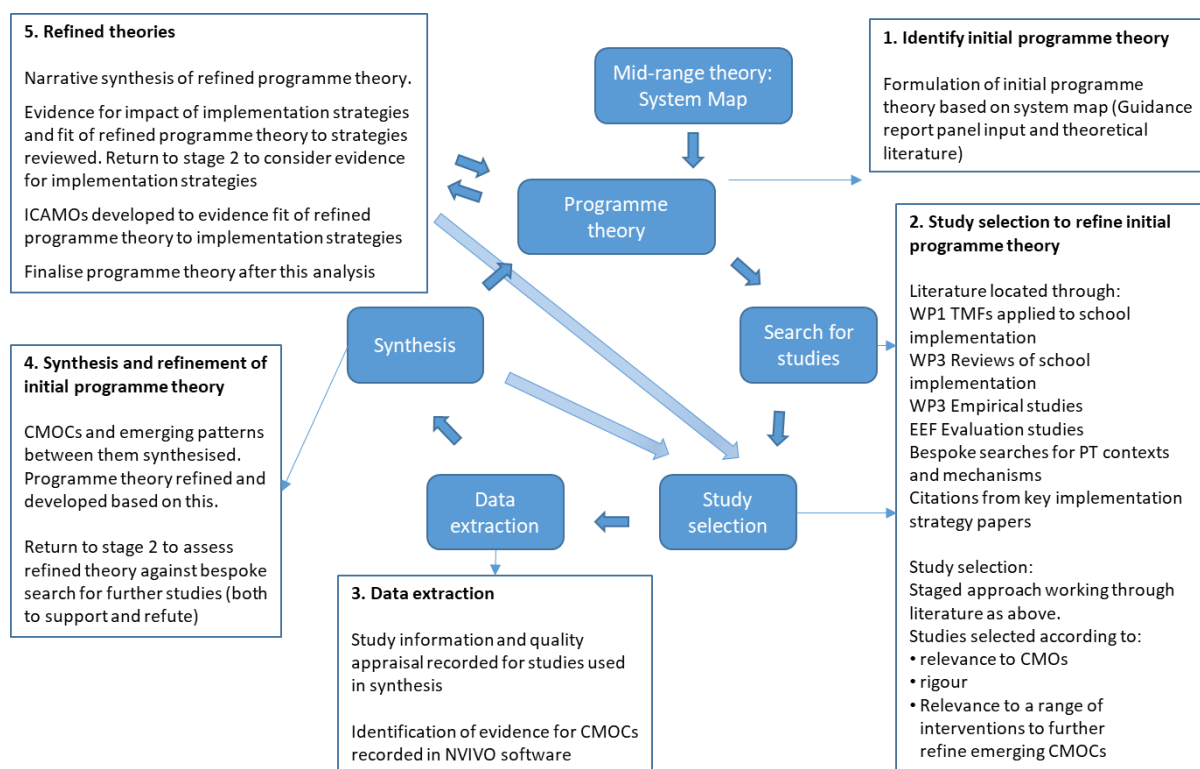


Figure 6: Methodological process for realist review

As a change to protocol, we undertook further review work focused on implementation strategies to help answer the second research question (see Box 5 in Figure 6). We used the School Implementation Strategies, Translating ERIC Resources (SISTER) implementation strategies to guide this analysis given that they represent a comprehensive set of implementation strategies for education derived from an existing and well used broader implementation taxonomy. We used evidence from our existing searches and a citation analysis to both analyse the impact of these implementation strategies and how the refined programme theory can explain their impact. This helped us further develop and evidence the programme theory. The CMOCs reported in this analysis were in the format ICAMO in relation to implementation strategies.

2. Study selection

We drew upon several strands of known literature and then bespoke database searches and citation analysis to identify relevant review and empirical literature that would provide evidence for contexts, mechanisms, and outcomes of relevance to implementation in schools and the initial programme theory. We moved through the following sources of literature as we developed the analysis:

- literature included in WP1 that applied TMFs to school implementation;
- WP3 reviews of school implementation (as synthesised in the first evidence map reported in the previous chapter);

- WP3 empirical studies (located but not previously synthesised);
- EEF evaluation studies;
- bespoke searches for contexts and mechanisms in relation to the refined programme theory;
- citations from key papers that developed the SISTER taxonomy of school-based implementation strategies; and
- additional finds from expert recommendations or key citations from included studies.

Inclusion and exclusion criteria for the review

Inclusion criteria for literature selected for this review were as follows:

Category	Criteria
Design	<p><i>Include:</i> Empirical research studies that may be quantitative, qualitative, and mixed-methods evaluations. Studies must measure or evaluate a school implementation factor, process, or strategy.</p> <p><i>Exclude:</i> School-based intervention evaluations reporting intervention outcomes or implementation outcomes with no reference to implementation factor, process, or strategy.</p> <p><i>Include:</i> Reviews that clearly and systematically identify and synthesise relevant empirical research using quantitative, qualitative and/or mixed-methods designs. Reviews will therefore need to report the search they have used and detail about inclusion criteria, i.e. a replicable process for study selection. Review aims and inclusion criteria would need to fit inclusion criteria for this review.</p> <p><i>Exclude:</i> Dissertations, conference proceedings, and meeting records given high numbers of relevant studies and study selection criteria of rigour.</p>
Participants and Setting	<p><i>Include:</i> Education institutions catering for 3–18 year olds.</p> <p><i>Exclude:</i> Higher Education and 0–2 nursery phases (i.e. before preschool education or early years foundation stage).</p> <p>Participants were typically pupils and/or staff. We also included studies whose participants are relevant wider school stakeholders, such as parents, local authorities, and practitioners working with schools.</p>
Intervention	<p><i>Include:</i> Any school-based intervention aiming to improve any intervention outcomes. Alternatively, or in addition to this, the intervention or phenomena of interest in a study could be an implementation strategy, tool, or intervention evaluated in schools aiming to improve school implementation outcomes.</p>
Measures and outcomes	<p><i>Include:</i> Studies reporting either intervention outcomes and/or implementation outcomes. We used the taxonomy of implementation outcomes and their synonyms proposed by Proctor et al. (2011): acceptability, adoption, appropriateness, feasibility, fidelity, implementation cost, penetration, and sustainability. However, we were inclusive and open to other relevant impacts that an implementation mechanism might have. We did not exclude based on the tools used to measure these outcomes, but recorded this information.</p>
Language	<p><i>Include:</i> English language only as there was no capacity to translate a wide range of languages and our experience suggests it is challenging to translate qualitative studies and retain meaning, as was important here.</p>
Relevance to Education in England	<p><i>Include:</i> Studies that have relevance to contemporary education in England. For example, we excluded public health interventions in low and middle income countries and computing interventions pre-2000 which hold less relevance to English schools. Relevance assessed in terms of combination of date of study, school context/system, and type of intervention.</p>
Relevance and Rigour	<p>In line with realist review best practice, we selected studies in relation to their relevance to our refined programme theory and rigour of their evidence for (or challenging) these. See Appraisal of Included Studies section for details. For example, not all research evidence on school leaders and implementation will be included in the final synthesis, rather it will be the evidence that helps to refine and challenge the contextual factors, the mechanisms that change behaviour, and the outcomes of these in relation to school leaders' role in implementation in education.</p>

Search strategy for identification of studies

We drew upon our completed searches from Work Package 1 and Work Package 3 as studies included in this previous work fit the inclusion criteria specified above. There were 32 empirical studies from Work Package 1 that have applied a theory, model, or framework (TMF) of implementation to an evaluation of the implementation of a school-based intervention. As they draw upon existing theory these studies held strong potential for indicating mechanisms and links to contextual factors. See the section in the prior chapter and Appendix 1 for the search strategy used in Work Package 1.

Work Package 3 located reviews and empirical studies focused on school implementation and considering the impact of implementation factors and/or strategies. As such, these studies may indicate the mechanisms and contexts underlying the factors and strategies. Work Package 3 also searched the education databases ERIC, Education Research Complete, British Education Index (via EBSCOhost) and the databases EMBASE, MEDLINE and PsycINFO (via OvidSp) and Social Science Citation Index (via Web of Science) using terms relating to implementation and implementation outcomes (e.g., fidelity, acceptability, adherence, and sustainability (Proctor et al., 2011)) and terms for

education 3–18 settings. Searches differed to Work Package 1 by adding in terms to capture school implementation strategies and specific factors identified in the system map. See Appendix 12 for the search strategy used in WP3. There were 57 reviews and 702 empirical studies to assess for relevance from WP3.

We conducted supplementary search approaches to locate further sources that may not have been retrieved from prior searches. For instance, we used reference lists from reviews included in WP1 and WP3 to locate two further review papers that would meet inclusion criteria for this review. We asked EEF colleagues to help with access to EEF evaluation reports, so these sources focused on highly relevant contexts and interventions could be considered to provide further evidence and challenge across a range of intervention types for emerging CMOCs. We returned to some of the additional literature recommended to us by members of the wider research team, the EEF guidance report panel, and collaborative partners for examples of context, mechanisms, and outcomes. To access latest literature related to school implementation strategies we screened citations from the two papers which introduced the Strategies, Translating ERIC Resources (SISTER) taxonomy of implementation strategies for schools:

Cook, C. R., Lyon, A. R., Locke, J., Waltz, T., and Powell, B. J. (2019). Adapting a compilation of implementation strategies to advance school-based implementation research and practice. *Prevention Science*, 20, 914-935.

Lyon, A. R., Cook, C. R., Locke, J., Davis, C., Powell, B. J., and Waltz, T. J. (2019). Importance and feasibility of an adapted set of implementation strategies in schools. *Journal of school psychology*, 76, 66-77.

(The most recent search for citations was conducted via Google Scholar on 5 January 2023)

We also ran a bespoke search for elements of the refined programme theory to locate any literature (that may not be restricted to school settings) that could help consolidate and challenge the programme theory as we further analysed literature and sought feedback from stakeholders. We used education databases and terms relating to the contexts and mechanisms from the refined programme theory to achieve this, drawing on support from the information specialist on our research team.

EPPI Reviewer software was used to record the retrieved studies and screening. Data extraction of study details was conducted in Microsoft Word. The review also used NVIVO software for working with the included papers for data extraction of relevant findings and synthesis.

Selection of studies

Study selection involved full text screening using the inclusion criteria indicated above. Full text screening was performed for all eligible studies, given that abstracts were unlikely to specify if there was relevant data in relation to realist C/M/O properties. In our bespoke searching and citation chasing we did employ title and abstract screening to exclude studies unrelated to school implementation. Full text screening was completed by one reviewer; independent screening was unnecessary given that the bulk of the study selection was with studies already selected for previous work packages. Once we had a final list of included studies against a refined programme theory, a second reviewer checked that each included study did evidence the aspect of a context/mechanism/outcome configuration that had been indicated in the data extraction and synthesis.

3. Data extraction and management

Extraction of the data from included studies was recorded using a specially developed data extraction table to record the data, and aid in the process of sorting, sifting, and annotating relevant study evidence. Initially, data extraction focused on the minimum requirements according to the EEF systematic review reporting guidance. This included details on authors, date, country, intervention, design, sample size, and implementation focus. This descriptive data extraction was recorded in Microsoft Word. Thematic analysis coding techniques were employed to track which data sources evidence which elements of the refined programme theory. This more organic coding of potential evidence across studies for emerging CMOC ideas and rigour of this evidence was data extracted using NVIVO as this allows the flexibility to assign codes to a range of evolving ideas, write memos to indicate thinking about connections across CMOCs and across studies, and provides a means of organising and categorising different study types as indicated in Figure 6.

Appraisal of included studies

We used the Mixed-methods Appraisal Tool (MMAT, V.2018) for a standardised and transparent appraisal of empirical studies using qualitative, quantitative (randomised controlled trials, non-randomised, and descriptive) and mixed-study methodologies. This assumes a range of study designs in included studies and may be amended if there is not this range. To assess the quality of any included systematic reviews we used A Measurement Tool to Assess Systematic Reviews-2 (AMSTAR 2). AMSTAR-2 classifies the quality of systematic reviews into four different categories: high (none or one non-critical weakness), moderate (more than one non-critical weakness), low (one critical weakness with or without non-critical weaknesses), and very low (more than one critical weakness with or without non-critical

weaknesses). The quality assessment of each systematic review was rated by one reviewer and checked by another. AMSTAR-2 tends to favour intervention effectiveness reviews, so we needed to bear this in mind when reviews focused upon implementation only. We categorised ratings for studies but use this to comment on the risk of bias of the evidence drawn upon for different final CMOs.

We were also sensitive to the quality of evidence for CMOs as we were analysing and synthesising studies. This was in terms of the key goals of relevance and rigour. As such, quality of evidence is used to determine which studies inform the refined programme theory and help to select amongst alternative CMOs. The identification of what is relevant to include was made based on the inclusion criteria and judged in relation to the evolving programme theory. A study was relevant if it could contribute to developing, testing, or refining our initial programme theory or parts of it. Decisions about relevance were made before decisions about rigour. A study is rigorous if the methods used to obtain the relevant data are trustworthy and credible. Appraisals of rigour judge the methods that were used to generate the data and this judgement might therefore differ across the data within a study that may contribute to different CMOs. In other words, unlike with conventional reviews of effectiveness studies, the rigour of evidence may be judged below the level of whole studies.

We followed the recommendation in the RAMESES guidance; for each example of relevant evidence identified, reviewers will identify and make notes about any issues that might affect data quality or rigour. We drew upon a previous review by Ijaz et al. (2021) that categorises rigour at four levels according to whether the argument made in a study fit the data, and/or whether the relevant outcome is at low risk of bias. Because the synthesis will involve close collaboration between reviewers, we had ongoing conversations to agree on levels of rigour rather than formally checking each decision. Whether theory is clear and convincing may not depend solely on the rigour of the data, because often circumstantial data or interpretations by study authors will still be useful in theory and triangulate evidence from different studies.

Finally, we were interested in the quality of our realist review findings. This places the lens of risk of bias in terms of the collective evidence for supporting and refuting theory rather than aggregating or giving undue importance to the quality assessments of individual studies. We draw upon Villarreal-Zegarra et al. (2022) who used the Confidence in the Evidence from Reviews of Qualitative research (CERQual), which has four components (Methodological Limitations, Relevance, Coherence and Adequacy of data) to assess each final main context and mechanism as part of the refined programme theory and ICAMO configurations in relation to implementation strategies (Lewin et al., 2018).

The four CERQual components are:

1. Methodological limitations of included papers: the extent to which there are concerns about the design or conduct of the reviews and empirical studies that contributed evidence to the realist synthesis finding.
2. Coherence of the review finding: an assessment of how clear and compelling the fit is between the data from the reviews and empirical studies and the realist synthesis finding that analysed the papers.
3. Adequacy of the data contributing to a review finding: an overall determination of the degree of richness and quantity of data supporting a realist synthesis finding.
4. Relevance of the included papers to the review question: the extent to which the body of evidence from the reviews and empirical studies supporting a realist synthesis finding is applicable to the context (implementation in schools that are relevant to the English school setting) specified in the review question.

After assessing each of the four components, we made a judgement about the overall confidence in the evidence supporting each realist synthesis finding (both individual ICAMO configurations and the contexts and mechanisms that are part of the refined programme theory). CERQual rates confidence as high, moderate, low, or very low. The final assessment was based on consensus between DM and RP. All findings start as high confidence and were then graded down if there are important concerns regarding any of the CERQual components.

4. Synthesis and refinement of programme theory

Synthesis of the diverse sources of evidence included in a realist review is conducted through a process of reasoning that is structured around several comparative reasoning activities, including:

1. juxtaposition of sources of evidence—for example, when evidence about a mechanism that changes implementation behaviour in one source enables insights into evidence about outcomes it might impact in another source;
2. reconciling of sources of evidence—when outcomes might differ despite seemingly similar contexts, further investigation is appropriate to find explanations for why these different results occurred;
3. adjudication of sources of evidence, based on rigour as described above.
4. consolidation of sources of evidence—when evidence about contexts, mechanisms, and/or outcomes are complementary and enables a more secure explanation to be built; and
5. situating sources of evidence—when outcomes differ across contexts, an explanation can be constructed of how and why these outcomes occur differently.

The transparency of a synthesis in a realist review is achieved by documenting these reasoning processes, describing how they are grounded in the empirical evidence and the justification of inferential shifts that occur through this engagement with the evidence (Pearson et al., 2015). NVIVO software allowed the flexibility for this coding of evidence and narrative memos to be written explaining decision-making and hypotheses as the synthesis progressed. Using NVivo software facilitated a transparent way of documenting and auditing the analysis process among researchers (Bergeron and Gaboury, 2020). This also implies the value of close and critical collaboration with other research team members. We held meetings for researchers to seek feedback from our wider review team, as well as encouraging close discussion as analysis progresses. We also built in feedback from the guidance report panel through comments on the interim report and a guidance report panel meeting where we presented the refined programme theory in July 2022.

Building on initial coding, we collated evidence into descriptive categories. In a penultimate step, we worked as a team to generate interpretive context, mechanism, and outcome configurations which were supported by evidence and made sense according to the data generated from previous work packages. Over sixty context, mechanism, and outcome configurations were generated; these would form the basis of the discourse which would refine the initial programme theory and construct a programme theory of school-based implementation from the evidence.

We have explained above why the WP1 system map did not represent a realist refined programme theory as it did not specify context-mechanism-outcome configurations. The lack of detail about outcomes and indication of potential links between context and mechanism also made it unsuitable as an initial programme theory to guide realist synthesis. The initial programme theory shown in Figure 5 provided that guide. An initial programme theory is set before searching for evidence that is synthesised to refine this theory using a realist synthesis specifying contexts, mechanisms, and outcomes. Therefore, we anticipate a refined programme theory that specifies configurations, changes the initial programme theory according to where there is evidence, and can potentially transform the initial programme theory through focus on context-mechanism-outcome configurations that are evidenced most strongly.

While we identified a wide range of context-mechanism-outcome configurations that related to one or two domains on the initial programme theory, this analysis did not always allow for juxtaposition and reconciling of evidence from across different examples of school-based implementation or a level of consolidation and situating sources of evidence that provided good confidence in the configurations. We also saw commonalities across configurations that related to different domains, demonstrating that our refined programme theory could bring together key contexts, mechanisms, and outcomes that were relevant across phases and domains of implementation and would be better evidenced.

Here we give an example of the analytical move from a wide range of realist CMO configurations during analysis prompted by the initial programme theory to more focused configurations as part of our refined programme theory.

Under the domain of readiness, we had an initial CMOC that evidenced:

Designated time, space and structure (context) is needed to share knowledge, experiences and views which identifies why priorities have emerged (mechanism), which can lead to appropriateness, feasibility and sustainability of the intervention selected in light of this discussion (outcomes).

Under the domains of professional development and support, we had an initial CMOC that evidenced:

School level planning and time allocation is needed for the right amount and type of professional development (context), revisiting training over time with support from an intervention expert helps to review and address individual needs (mechanism), this can lead to increased fidelity and sustainability (outcomes).

Under the domain of communication, we had an initial CMOC that evidenced:

An effective communication system is needed for implementation leaders to reach implementers (context); this can allow reminders and support to encourage implementers to self-monitor their delivery (mechanism), which can lead to increased fidelity and sustainability of the intervention (outcomes).

Under the domain of teams, we had an initial CMOC that evidenced:

Time needs to be allocated and communication channels planned and tested (context) so that implementers can share their experiences, support one another, and problem-solve intervention delivery (mechanism); this can increase fidelity of intervention delivery and maintain buy-in (outcomes).

Across these different domains and what were initially separate analyses, we saw commonalities across context-mechanism links such as these. Therefore, in this example we considered the evidence across implementation domains that the context of supportive structures would trigger opportunities for the mechanism of staff reflecting on implementation, which would drive a range of implementation outcomes. This process helps to explain the transformation from the initial programme theory to refined programme theory as described below. More detailed examples are provided in Appendix 15.

Our process of theory refinement generated a greater depth and breadth of understanding of school-based implementation. Through undergoing stages of realist analysis, we were able to co-construct context, mechanism,

outcome configurations categorised according to initial programme theory domains. Via a process of iterative axial coding, we examined linkages, interactions, and feedback loops to cross-examine relationships between domains (Barnett-Page, 2009). We also undertook additional searches of literature in response to the emerging refinement of programme theory and subsequently included some additional studies located due to their resonance and relevance. Subsequently, our analysis generated higher level interpretation in which to expand and enrich the initial programme theory.

We developed a refined programme theory that cut across the domains of the initial programme theory in May 2022. Through feedback and considering the programme theory in relation to implementation strategies we refined the programme theory further, making minor changes to wording in relation to contexts and mechanisms.

In the sections below we present our main analyses. First, an explanation and narrative discussion of evidence for the refined programme theory. Second, we explain how we further reviewed evidence related to the use of school implementation strategies and how the refined programme theory can help evidence the use of implementation strategies through the application of realist ICAMO configurations (implementation strategy – context – actor – mechanism – outcome) in line with the refined programme theory. More methodological detail about this second part of the review is presented ahead of the implementation strategy findings. We present this work chronologically since the refined programme theory was in development and received feedback before we started reviewing implementation strategies.

Findings

Included studies

We begin the Findings section with a descriptive synthesis of the papers which were included in the realist synthesis. We then move on to introducing and evidencing the refined programme theory before reviewing evidence for implementation strategies and the application of the programme theory to these. Results of the study selection process are documented in Figure 7, which indicates the number of studies of relevance from each category of literature. Multiple papers from the same study were collated so that each study rather than each paper is the unit of interest.



Figure 7: Study selection for Work Package 4

The diagram shows that 293 papers were included in our realist synthesis:

- 27 studies were included from 32 empirical studies that applied a TMF to implementation of an intervention in a school setting, previously included in WP1;

- 44 reviews were included from the 57 reviews previously included in WP3 and displayed in the first evidence map in the previous chapter;
- 125 empirical studies were included out of the 702 studies located during WP3 screening;
- 40 EEF evaluation reports were included from the 163 that we had available to screen;
- 17 papers that were located through a bespoke search using terms for contexts and mechanisms from our refined programme theory were included after full text screening;
- 70 papers relevant to school implementation;
- 24 papers that cited either Cook et al. (2019) or Lyon et al. (2019) were included after screening 96 of these citations; and
- 16 additional finds that were recommended by experts including the guidance panel or were key citations in included studies were included.

To reiterate, study selection involved a staged process moving through these different sets of evidence. While we moved through each set in turn, the process was more iterative as we returned to different evidence to consider our analysis as it progressed. We selected papers that held relevance and rigour either in identifying potential contexts, mechanisms, and/or outcomes or helping to juxtapose or situate context-mechanism-outcome configurations from analysis thus far.

See Appendix 16 for the data extraction of the 293 included studies. The papers included in our review were more often empirical, with 59 reviews included. The empirical papers included a relatively even spread of quantitative, qualitative, and mixed-methods studies (quantitative = 78, qualitative = 90, mixed-methods = 65); 36 identified their design as being or including a process evaluation component. Interventions were most often categorised as teaching and learning (n=142). Physical health interventions, which include nutrition, exercise, and substance related foci were seen more often (n=64) than mental health interventions (n=39). Thirty-three papers focused on behaviour interventions. Only 16 of the 59 reviews included any intervention, indicating that reviews were more likely to consider implementation of a particular type of intervention. Around half of the studies were located in the U.S. (n=148), 57 were based in the U.K., and 11 were based in Australia. A range of other countries were represented by three or fewer studies. Most of the reviews included international literature (n=48 international empirical studies or reviews), although seven reviews restricted their included studies to either the U.S. or U.K. context.

Quality appraisal

See Appendix 17 for quality appraisal ratings for included Work Package 4 studies. Our quality appraisal showed reviews very often described the included studies in adequate detail. Reviews tended to report clear study selection, used a comprehensive search, and established review methods prior to review conduct often referring to a protocol. Reviews less often provided a list of excluded studies, reported the funding of included studies, or related their review findings to quality appraisal. It was noteworthy that several reviews we included would appear to be of lower quality because they focused on aspects of implementation rather than a typical intervention-focused systematic review. That said, around ten reviews we included were lacking in a wide range of indicators of systematic conduct including using a comprehensive search strategy.

Included qualitative research was typically of very high quality; around 20% were rated as not sufficiently substantiating findings with data, but otherwise these studies were strong across the board. Mixed-methods studies were also typically of high quality, the only issue being around a third of these were not rated as having both elements meeting quality criteria for the methodological tradition. For the quantitative studies, RCTs were typically of higher quality than non-randomised studies. There was rarely complete outcome data across either quantitative design though. Non-randomised studies also did not always use representative samples or account for confounding variables in analysis. Quantitative descriptive studies did not tend to use representative samples either and there was higher risk of non-response bias in these.

Fuller details about the included studies are shown in data extraction tables in Appendix 16 and quality appraisal tables in Appendix 17. We also assessed the quality of our realist review findings using CERQual assessing on methodological limitations, relevance, coherence, and adequacy of data for each final main context and mechanism of the revised programme theory described in the next section and ICAMO configurations in relation to implementation strategies. This provides judgements about confidence in the evidence supporting each realist synthesis finding that are reported in the relevant sections below. Appendix 18 shows the detailed confidence ratings for each construct in the refined programme theory and ICAMO configurations. In the findings, the rating and rationale is briefly summarised in the text.

As indicated in this and the next section, the quality of the individual papers that we have included and the relevance and range of data informing the refined programme theory is good. However, it is also worth considering the extent to which the included papers themselves speak to the research questions posed for WP4, as well as the theory constructed based on our realist synthesis. A range of studies and reviews indicate how different dimensions, factors, and processes impact implementation outcomes in schools. There are two important points to note. Firstly, in keeping with our system map synthesis in WP1, it is challenging to isolate a dimension like leadership, factor like fit of the approach, or process like monitoring from the range of other interacting components or specify exactly what the right kind of leadership, level

of fit, or type of monitoring would be across all contexts. Secondly, we found more evidence of components of implementation having some impact on implementation outcomes, rather than directly upon pupil outcomes.

For the impact of implementation strategies, again we found few studies that isolated individual implementation strategies to measure their causal impact on implementation or pupil outcomes. Indeed, several studies and reviews evidence the argument for a combination of implementation strategies being used in school settings, rather than one being effective enough to use in isolation. Those studies that have reported on the incremental impact of using one implementation strategy versus not are understandably small scale in order to make this comparison and not withhold an expected beneficial strategy from many school staff over the long-term. As for wider implementation factors, there is relatively little evidence that shows a direct impact on pupil outcomes. Although, usefully, some studies do indicate how the impact of implementation strategies on pupil outcomes is through their more direct impact on implementation outcomes, often fidelity.

Refined programme theory

Using the realist methods detailed above, we developed a refined programme theory which captures the key behaviours, processes, and practices of effective school implementation (see Figure 8). By synthesising education studies using realist methods we were able to generate a richer understanding of how implementation works, for whom, in which contexts, and through which mechanisms as well as for which outcomes. Our refined programme theory suggests three broad contexts and three broad mechanisms; these interact, and it is through these interactions between contexts and mechanisms (depicted by the arrows and expanded through narrative examples) that the explanatory power of the programme theory is proposed. For example, our realist review synthesis shows how the context of enabling structures allows collection of data and time to work with the data, which then means school stakeholders can use the mechanism of reflecting to evaluate the data and make decisions that help to sustain an intervention that has been put into practice and, therefore, continue to improve the intervention's intended outcomes. The refined programme theory is specific to schools, given the education evidence that was synthesised to reach this output, however, it aims to be relevant across different types of schools and approaches.

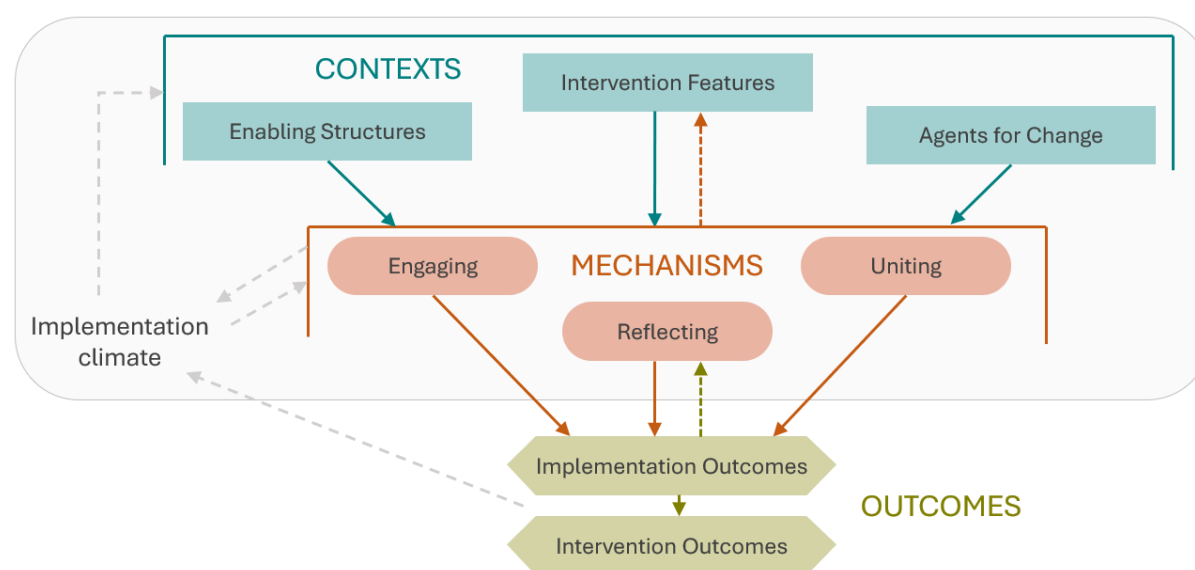


Figure 8: Refined programme theory

Solid arrows indicate evidenced direct impact between components; dotted arrows indirect feedback.

Overview of refined programme theory

The top level of the refined programme theory represents *contexts*. We define contexts as the conditions or factors with the potential to enable or constrain mechanisms during implementation. This appreciates that context operates in a dynamic and emergent way over time in schools as systems (Coldwell, 2019). We found evidence which suggests that three contexts are particularly cogent when implementing evidence-informed interventions in schools: enabling structures (systems and support that allow for effective implementation), intervention features (characteristics of interventions that predict conditions for implementation), and agents for change (conditions in which actors are empowered or can facilitate this in others to play key roles in implementation).

The middle level of the refined programme theory represents *mechanisms*. We define mechanisms as the underlying processes or social structures that can be triggered in the right context (Astbury and Leeuw, 2010). This broad definition appreciates the wide range of actors collectively involved in implementation in schools and how implementation of new interventions has the potential to change the systems (schools and beyond) that these individuals are part of. Three mechanisms emerged as particularly influential in our realist synthesis: engaging (voices, interest in implementation, and collaboration), reflecting (upon data, including concerns, successes, and needs), and uniting (views, values and understanding about implementation, and the intervention).

Implementation and intervention outcomes

The bottom level of the refined programme theory represents the *outcomes* generated through the triggering of these mechanisms within one or more of the three contexts. These outcomes are implementation outcomes and/or intervention outcomes. We are informed by the widely used taxonomy of implementation outcomes developed by Proctor et al. (2011), which includes the following break-down of evidence-informed outcomes commonly associated with implementation:

- acceptability—the perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory;
- adoption—the intention, initial decision, or action to try or employ an innovation or evidence-based practice;
- appropriateness—perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting, provider, or consumer; and/or perceived fit of the innovation to address a particular issue or problem;
- feasibility—extent to which a new treatment, or an innovation, can be successfully used or carried out within a given agency or setting;
- fidelity—degree to which an intervention was implemented as it was prescribed in the original protocol;
- implementation cost—the cost impact of an implementation effort;
- penetration—the integration of a practice within a service setting and its subsystems; and
- sustainability—the extent to which a newly implemented treatment is maintained or institutionalised within a service setting's ongoing, stable operations.

There is evidence that implementation outcomes impact intervention outcomes, which captures pupil, staff, and wider community outcomes (Dowling and Barry, 2020; Rowe et al., 2021; Sanetti et al., 2021). This evidence often suggests an association between the two types of outcomes with improved implementation outcomes seen with improved interventions outcomes. However, we located a range of studies that demonstrate differences in the strength of intervention outcomes according to whether or how much an intervention has been adopted, sustained, or practiced with fidelity. Fidelity is often associated with pupil outcomes, where the more closely an intervention can be delivered as intended, the better pupil outcomes are (e.g. Abry et al., 2013; Livet et al., 2018). Killerby and Dunsmuir (2018) systematically reviewed studies which correlated or directly compared the level of implementation of school-based interventions with pupil outcomes. They found some evidence that well implemented interventions were associated with beneficial pupil outcomes, but this was challenged by study quality and varying measures of fidelity. In more specific intervention contexts, delivering an approach with fidelity is linked to greater pupil attainment and comprehension, particularly in relation to interventions which have a primary learning focus, such as phonics (King and Kasim, 2015; Merrell and Kasim, 2015). Other implementation outcomes such as adoption of an intervention and sustaining it over time are clearly necessary to support pupil outcomes too (McLoughlin et al., 2022). However, evidence suggests that the implementation factors which lead to positive pupil outcomes are challenging to isolate (Cane and Oland, 2015; Lendrum and Humphrey, 2012). This is because they are confounded by the adaptation and tailoring of approaches which occurs during planned teaching (of content which is expected to be put across to pupils) and during unplanned teaching (of content which occurs in response to real-time feedback from pupils) (Fixsen et al, 2005; Dyssegaard et al, 2017; Albers et al, 2021). The arrow from implementation outcomes to intervention outcomes, for example, indicates how using an intervention with the correct dosage of core components, fostering buy-in toward the intervention, and sustaining use of the intervention over time is necessary (but not sufficient) to see beneficial intervention outcomes (Ashworth et al, 2020; Humphrey et al, 2021; Koh and Askell-Williams, 2021; Noell and Gansle, 2009). For instance, Zhang et al. (2021) show how fidelity is linked to pupil outcomes in a study of school-wide positive behaviour support, but time for planning and consultation was needed to show this fidelity (context of enabling structures in the programme theory). We expect that there is further evidence of this link between implementation outcomes and intervention outcomes; our focus on evidence that helped identify and show causal links between contexts, mechanisms and outcomes meant that we were less focused on research exploring the impact of implementation outcomes on intervention outcomes.

Implementation climate

On the periphery of the refined programme theory is implementation climate. This is included in our model as we found evidence that implementation in schools is both influenced by previous experiences of implementation and beliefs about future implementation, while any current experience of implementation provides learning to shape beliefs and capacity. As such a school's implementation climate is slowly changing, as well as informing experiences. Powell et al. define implementation climate as 'the absorptive capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization' (p. 1, 2021). Implementation climate differs to school climate because it has a strategic focus on implementation and can be specific to the intervention being introduced (Weiner et al., 2011). It includes the social, cultural, and environmental norms which influence the nature of implementation and associated behaviours including that of leadership (Jacobs et al., 2014; Lyon and Bruns., 2019). School climate is more general; it provides a more comprehensive understanding of how a school is functioning and less directly tied to the strategic goals of evidence informed practice (Thayer et al., 2022). Because school climate is often tied to whole-school functioning, like behavioural expectations, wellbeing, and community partnerships, there may be a more direct link between broader school climate and the more specific implementation climate in relation to some whole-school approaches with school climate informing support, use of data and integration of these types of approaches with continuous school improvement (Lyon et al., 2018).

We found some evidence for implementation climate and its reciprocal influence on implementation, although this was rarely directly related to the contexts, mechanisms, or outcomes evidenced as linked as part of the realist synthesis. Implementation climate therefore sits as a 'perspective' (Bonnell et al., 2022) that can influence the relationship between context-mechanism-outcome configurations and also be impacted by a school's experience of implementation. For instance, as schools put in place enabling structures that help staff reflect on implementation, this can help increase wider support for evidence informed practice, recognition and use of data that is sustained or ready to be utilised in relation to implementation of different approaches in the future.

There are two types of arrows shown on the refined programme theory, solid and dotted: the solid arrows represent causal links between contexts, mechanisms, outcomes, and implementation climate; dotted arrows represent iterative feedback flowing between these constructs. For example, implementation climate can often shape contexts, mechanisms, and outcomes. However, outcomes and the mechanisms that led to them also continue to shape the implementation climate over time. Dotted lines from 'implementation outcomes' to 'reflecting' indicates that the reflecting that is taking place in beneficial implementation practice often involves reflection on outcomes to date. Likewise, the dotted line from the 'mechanisms' to 'intervention features' is included to show that often school stakeholders are engaging, uniting, and reflecting in relation to the intervention being implemented.

Contexts and mechanisms

Across each section of the refined programme theory we use horizontal lines. These lines represent interaction between the contexts enabling structures, intervention features and agents for change, and between the mechanisms engaging, reflecting, and uniting. Sometimes, more than one context or mechanism resonated with aspects of implementation. For instance, an implementation leader role might be an enabling structure but carry with it the opportunity to facilitate others as an agent for change. Likewise, uniting values towards implementation drives beneficial outcomes, but reflecting upon these values is necessary too. When we get more focused in our synthesis of particular implementation strategies we focus on links between contexts and mechanisms that are better evidenced.

The line across the three contexts also represents the interaction between two key influences which shape the nature of the three contexts. The first of these are structural influences and the second are relational influences, both of which are often complex in nature. In complicated systems we can usually predict outcomes by knowing the starting conditions and through relevant expertise and analysis, whereas in a complex system the starting conditions may produce different outcomes because of the interaction of elements in the system (Snyder, 2013). The context of enabling structures and associated conditions are often complicated, meaning they can be predictable and can usually be approached in a systematic way. Enabling structures provide many examples of complicated systems, procedures, and organisational conditions including, data collection and dissemination systems, wider policies, finance and time considerations, and the resource management necessary for implementation. On the other hand, relational influences are broadly captured by the context of agents for change and the ways in which conditions and factors seek to empower and involve staff in implementation. As these conditions are linked to the ways in which implementers and receivers of implementation negotiate and make sense of what is going on, these processes are often unpredictable and complex, meaning that they require responses which are creative and resilient (Koh and Askill-Williams, 2021).

The context of 'intervention features' involves both structural and relational elements required for implementation. For example, the type of intervention and the resources it requires influences structural conditions (Fixen et al, 2005; Albers and Pattuwaage 2017, Dyssegaard et al, 2017; Cook et al, 2019; Shoesmith 2021) while intervention features will also

set the condition for which school staff will be key agents for change, including champions, local opinion leaders, implementation team members, and other staff who can support the use of the intervention (Roach et al, 2009; Trapani and Annunziato, 2018; Weatherson et al, 2017). Unlike some other realist reviews, we have not separated out intervention features about which to analyse contexts and mechanisms; this is because intervention features are relevant across the range of interventions that may be implemented in schools and fit the definition of context as a condition which can be manipulated given that interventions are often selected from alternatives and existing practice to implement in schools. We draw upon the idea that intervention activities can be separated from contexts and mechanisms in our ICAMO analysis, which considers implementation strategies as these activities.

While the agents for change and intervention features contexts in the programme theory can be relational, implying conditions which allow interaction between people as part of implementation, the mechanisms are different as they are more firmly about the actions and social processes involving a wider range of the school community who are involved in implementation as they engage in implementation, reflect on it, and take action that unites them in relation to the intervention that is being introduced in the school. Mechanisms are therefore more firmly about the actions of the people and groups involved in implementation. The next section explains and unpacks each of the programme theory contexts and mechanisms, bringing in examples of evidence we located to support these elements and the overall realist programme theory of school-based implementation.

In the sections below we expand on the three contexts and three mechanisms in detail. We provide an overview of the included studies that provided evidence for each component of the programme theory and provide a rationale for the quality judgement measured using CERQual for each context and mechanism. Table 19 provides an overview of the number of included studies and quality rating.

Table 19: Number of included studies and quality rating for each programme theory component

Context or mechanism	Number of included studies	CERQual quality rating
Enabling structures	95	High
Agents for change	107	Moderate
Intervention features	85	Moderate
Uniting	64	High
Reflecting	71	High
Engaging	64	Moderate

Breakdown of refined programme theory

In the following sections we detail each of the three contexts and three mechanisms. We define what is meant by each of these components of the programme theory, overview the evidence that supported their inclusion in the programme theory, describe what is in scope for the context or mechanism, and then indicate how evidence suggests it is related to outcomes; finally, we show links between the component of the programme theory and implementation strategies, which are then expanded in the second part of the review. The refined programme theory also evidences the link between contexts, mechanisms, and outcomes and therefore each of the six contexts and mechanisms are not intended to be judged only in isolation.

Contexts

Enabling structures

Enabling structures encompass a range of systems and procedures that can help or hinder implementation within the school context. Enabling structures are considered a context as they are structures that can be put in place or utilised to support implementation strategies and processes. Enabling structures facilitate change. They provide the systems and structures of implementation, such as time, space, systems for monitoring and evaluating, and resource management. As a context they provide a foundation for processes and strategies to utilise mechanisms and lead to implementation and pupil outcomes.

Included studies

Ninety-five of our 293 included papers provided evidence for enabling structures as a context. Compared to the overall included papers, they were more likely to be empirical studies applying a TMF and less likely to be an EEF evaluation report. They were more focused on behaviour and health interventions and less likely to be focused on teaching and learning interventions. They were less likely to be quantitative papers but were typical for other intervention types and study designs. Quality of these 95 papers appeared typical for the wider set of included papers. As was typical across the programme theory elements, papers did not typically refer to ‘enabling structures’ but we located literature that did when we searched for this. We do not have concerns about the relevance, rigour, and adequacy of the evidence used to develop our conceptualisation of enabling structures. We are also confident in the coherence of this review finding. Therefore, we rate this element of the programme theory as high confidence according to the CERQual rating.

What is in scope

‘Enabling structures’ refers predominantly to the structural and often complicated conditions for implementation which are often put in place by a range of implementation leaders. They provide the necessary organisation so that implementation can take place, they include:

- school structures (e.g., timetables);
- logistics and processes (e.g., data monitoring systems);
- resources (e.g., funding, external support);
- time (e.g., allocating meeting time);
- policies (e.g., MAT, local or national); and
- roles (e.g., implementation lead, Pupil Premium lead, governance, and leadership).

‘School structures’ encompasses the broad range of organisational practices and tools used by schools which set parameters for when and how an intervention can happen. For example, timetables guide practice by providing and designating adequate time for implementation activities, they can therefore help to support implementation delivery (Arnold et al., 2021; Freeman et al., 2003; Robinson and Gray, 2019).

‘Logistics and processes’ includes the range of ways that schools monitor, evaluate, and record actions taken to make progress and be accountable—for example, the ways in which schools collect and use different forms of data to inform decision-making and provide feedback (Schildkamp 2019; van Geel et al., 2017; van Kuijk et al., 2021).

‘Resources’ refers to tangible elements that help get implementation off the ground and maintain it. Enabling structures resources are more focused on implementation resources rather than specific intervention resources. These practical conditions may include internal physical resource availability, development, and maintenance as well as external resources such as the availability of support and training (Distel et al., 2019; Langford et al., 2015; Mendenhall et al., 2010; Zaldiver et al., 2019). Resources also include factors that cross internal and external spaces, such as funding and financial structures (Alonge et al., 2020; An et al., 2021). Enabling structures can also be informed by the nature and location of the school, including pupil demographics, which can impact resource availability (Gu et al., 2021).

‘Time conditions’ refers to providing the right amount of time for various aspects of implementation. This includes time for preparing for implementation of an intervention and appreciating the need for ongoing time allocation for aspects of implementation that need to be revisited, like planning, professional development, and assessing needs (Desimone, 2002; Durand et al., 2016; Zhang et al., 2021). Time, as a contextual condition, influences what and when implementation takes place, as well as how (Chalkley et al., 2018; Dyssegaard et al., 2017; Herlitz et al., 2020).

‘Policy structures’ refers to policies present both within and beyond the school which influence trends, priorities, and opportunities in relation to implementation (Arnold et al., 2021; Chambers et al., 2020; Humphrey et al., 2020). Examples of policies include school behaviour or assessment policies, local authority or multi-academy trust policies, and policies or similar formal guidance which many mainstream schools must follow such as a national curriculum, Pupil Premium, and special educational needs and disability statutory frameworks.

‘Roles’ refers to the designations school staff may have which influence implementation through developing and maintaining enabling structures. These roles may be implementation-specific or broader, for example, assessment and data lead, senior leader, curriculum area lead, or special educational needs coordinator (Freeman et al., 2003; Fixsen et al., 2005; Greaves et al., 2017). They work hand in hand with other aspects of enabling structures as designating roles often provides dedicated time and resource for implementation.

How does the evidence indicate outcomes?

Evidence suggests that school structures, including timetables and other organisational tools, are key contextual factors that help the implementation of evidence-based practice by providing the time, space, resources, and training pathways necessary to facilitate action and deliver an approach with consistency and sustainability (Blaine et al., 2017; Cane and

Oland, 2015; Edwards et al., 2014). Evidence provides tangible examples of the type of structures found to support implementation and how these worked, ranging from connections with local authorities, effective training pathways (Denford et al., 2016; Hepburn et al., 2019), the setting of clearly defined timeframes and milestones, and coordination and monitoring implementation activities (An et al., 2021). The presence of structures as well as their type and range impact the degree to which implementation is enhanced or inhibited. For example, data collection and monitoring systems can help to guide implementers by providing clarity and a systematic way of capturing and using data to inform practice (Calvert et al., 2020; Gagnon et al., 2020; van Geel et al., 2017). To achieve high fidelity and sustainable implementation, implementation processes are enabled by school leaders enacting supportive and contextually appropriate organisational structures and cultures (Fixsen et al., 2005; Herlitz et al., 2020; Leung et al., 2020). For example, in a study of the universal free school meal (UFSM) programme roll-out in Scotland, school senior leaders were present to oversee the intervention, they identified ways to reach out to families, and reflected on procedural pressure points preceding the allocation of roles to teachers (Chambers et al., 2020). School leaders can also use the latest evidence to address known barriers to interventions and leverage family involvement channels (Grossi et al., 2019; Hung et al., 2014; Van Kuijk et al., 2021). For example, when implementing a healthy and environmentally sustainable intervention such as 'walking school buses', evidence suggests that leaders can help increase the sustainability and uptake of approaches by understanding time constraints, barriers to volunteer recruitment, and carer's safety concerns while also increasing access and convenience for families by putting in place structures which acknowledge these factors (Smith et al., 2014).

Evidence links logistics and processes to a range of pupil and implementation outcomes including social and emotional development, academic attainment, efficiency, and penetration. Structures and systems which help guide and facilitate a diversity of data practices can help provide a window into the forms of reasoning which underpin the deeper thinking processes that drive behaviours, practice, and pupil outcomes (van Geel et al., 2017). An enabling structure that allows data collection from a range of stakeholders over time means that conducting needs assessments can help to gain an accurate picture of what kinds of challenges are being encountered by implementers and what support would be helpful to mediate these (Durand et al., 2016; Hudson et al., 2020; Koh and Askell-Williams, 2021; Maxwell et al., 2019). These insights can, in turn, help to bring about greater implementation outcomes including intelligent adaptation, sustainability, and penetration of an approach over time (Herlitz et al., 2020) if they are used to inform next steps. In a study which examined the implementation of an integrated STEM curriculum, researchers found that data which provided snapshots of implementation at various timepoints helped to monitor implementation patterns or tendencies (Gale, 2020). This was helpful in building understanding around how those involved engaged in implementation over time and what broader influencing factors interacted with practice. Increased or decreased implementation consistency or motivation could be situated within broader context, for example, motivation increases were often found post-training or during active mentoring by inner or outer school members of the implementation team (Beidas et al., 2012; Gale, 2020). These periods of increased momentum identified through data collection could be utilised for engaging staff in new ideas as receptivity to changes to the status quo may be higher (Trapani, 2018). Similarly, linking patterns of low consistency or motivation to certain periods when there is less time available, such as examinations or other responsibilities, could help implementation leaders to plan better for this (Arnold et al., 2021; Gorard et al., 2020; Maxwell et al., 2019). This understanding could generate a more robust and responsive approach to implementation by informing decisions based on critical reflection of the contextual factors likely to impact community members (Alonge et al., 2020; Fisher et al., 2020; Freeman et al., 2014; Moore et al., 2021).

Resources (e.g., funding, external support) is evidenced to impact implementation in several ways including adaptability, feasibility, buy-in, and implementer wellbeing. Schools can develop effective knowledge-sharing and networking structures with other schools. This may have a range of benefits, from having access to a wider range of resources as well as access to more opportunities for shared learning and training (Goldstein and Olszewski 2015; Ikemoto et al., 2016; Ryan Jackson et al., 2018; Weiland et al., 2018). Similarly, processes of planning can help implementers to establish what resources are available or need developing to deliver an intervention effectively (Alonge et al., 2020; Dyssegaard et al., 2017; Frigge et al., 2019). Revisiting plans can help to explore how well resources are meeting the needs of implementers and those receiving an intervention while also helping to facilitate conversations which unite implementers in practice and help to establish intervention effectiveness as well as how an intervention continues to align with and evolve practices, helping to generate sustainability (Durand et al., 2016; Leung et al., 2020; Reedy and Lacireno-Paquet, 2015).

Time, which includes the availability and use of time, is linked to implementation outcomes ranging from acceptability and appropriateness to penetration and sustainability (Ismail et al., 2021; McLoughlin et al., 2020; McLoughlin et al., 2022). For example, a study which examined assessment for learning in schools over a three-year period (Smith and Engelsen, 2013) found that school leaders' role was key in facilitating the time necessary to engage in the active learning processes involved in implementation. Also, staff needed adequate provision of time from the start, which was found to be a key enabler or barrier to progress. In cases where too little attention had been given to organisation of time and space for leaders to undertake the groundwork underpinning implementation processes such as engaging with evidence, key concepts, and strategies, this negatively impacted on leader's self-reported capabilities and capacities to lead implementation effectively (Smith and Engelsen, 2013). Similarly, Ismail et al.'s (2021) process evaluation of school fruit and vegetable interventions found that insufficient teacher time to prepare was a key barrier to generating positive

implementation outcomes across studies (2021). This study also found that limited funding structures compounded negative impacts on staff, planning, and other resources beyond time constraints; for example, rural schools were typically constrained by higher costs for fruits and vegetables, which impacted on choice and structures for obtaining fresh produce.

Zhang et al. (2021) focused on the time elementary schools allocated to planning and consultation and how this impacted fidelity and pupil outcomes. They found that time allocated for purposes of staff reflection, collaboration, and planning demonstrated strong positive associations with pupil behaviour outcomes. The relationship was mediated by fidelity; meaning that when time for planning and consultation increased fidelity, pupil outcomes were more likely to improve.

Time is also relevant to implementation when considering schools as complex, adaptive systems. Viewing and understanding schools through this lens acknowledges the ways in which structures provide the conditions for enabling or constraining mechanisms to fire, including the ways in which people and organisations are influenced by, and actively negotiate with, wider social, cultural, and political systems in ways that influence implementation (Koh and Askeff-William, 2021). A complex adaptive lens also proposes value in focusing just as much on process as on outcomes. This challenges the notion that school-based implementation of evidence is about getting fast results. Focusing primarily on the quality and depth of learning that is occurring as part of the process of implementing change may be a better way of fostering sustainability than focusing primarily on rapid, time-limited goals, which may spark surges of progress followed by losses of momentum as burn out or other priorities take precedence (Gabby et al., 2017; Gaias et al., 2020; Hall, 2013).

Evidence suggests that policies (e.g., MAT, local or national) influence a range of implementation outcomes including sustainability, costs, appropriateness, and adoption. At the inner school level, schools can develop an open-door policy between senior implementation leaders and members of the implementation team to ensure barriers to communication are minimised and intelligence is shared. A greater focus on enabling communication can become a valuable resource for implementation in and of itself as it can encourage ideas, reminders, feedback, and promote discussion (Grossi, 2019; Hudson et al., 2020). Schools are also held accountable by external systems acting at the outer school level and, in England, this exerts a strong influence on decisions made within the school (Guhn, 2009; Sun, 2007). This influence can be reflected in the ways in which structures enable or inhibit the implementation of evidence-based practice (Desimone, 2002). For example, national accountability structures may encourage schools to monitor exclusions as an indicator of the success of a new behaviour management strategy. However, a school may find it more informative to measure student–teacher relationship quality as an outcome of a new behaviour strategy. A case study by Bridich (2021) found that district mandated school performance measures can constrain data collection that is valued and can demonstrate the initial impact of an intervention put into practice. However, external systems of accountability can facilitate implementation of new approaches by balancing a framework for essential standards with the professional autonomy and freedom to set contextually appropriate values, priorities, and markers of success (Hopfenbeck, 2015; Sun 2007).

Roles (e.g., implementation lead, Pupil Premium lead, governance, and leadership) are linked to a range of implementation outcomes relating to clarity, support, and advocating for an approach (Chang et al, 2008; Melgarejo et al, 2020; Simmons and Martin, 2019). Identifying, appointing, and training leaders in line with the scope and remit of an intervention can help to influence degrees of adoption, accountability for fidelity and sustainability (Nelson and O’Beirne, 2014; Reumann-Moore et al, 2011; William et al, 2022). Establishing clear roles can also contribute to a smoother coordination of implementation strategies because individuals know who to go to for support, questions, or activities (Cheung Kong 2019; Corboy and McDonald, 2007; Massey, 2020). Having clear roles and designated leaders can be especially effective as a protective buffer against unnecessary disruption to implementation due to unforeseen events such as staff turnover (Thaker et al., 2008); this is because it is often clearer who and what needs to be handed over to others. Evidence indicates that when roles are expanded to include responsibility for pupil and family involvement this can increase acceptability and sustainability by encouraging engagement, interest, understanding, and commitment (Grossi et al., 2019; Sadaji 2021; Samdal and Rowling 2011; Van Kuijk et al., 2021; Weist et al., 2019). Evidence also connects roles within professional development as key. For example, the ways in which training roles are defined and implemented can help or hinder implementation and generate greater degrees of buy-in, feasibility, and fidelity (Cane and Oland, 2015; Walker et al, 2022). Train-the-trainer strategies, whereby designated school staff are trained to train others in new practices related to an intervention, has been shown to be effective in uniting practice through building the agency of implementers, cascading knowledge and skills throughout the school community (Alonge et al., 2020; Blaine et al., 2017; Kisa and Correnti, 2015). However, the agency and empowerment that means the right people in the right roles can facilitate and support other actors’ implementation is relevant to the agents for change context.

How does enabling structures as a context link to strategies?

‘Enabling structures’ provide a context for many implementation strategies (Cook et al, 2019) although in some cases this is implicit. Some strategies explicitly relate to structures at the inner and outer school levels and how these provide the context for action. Strategies which fall under the umbrella of changing infrastructure and accessing new funding, for example, have the scope to alter school organisation, environment, policies, and wider school networks in ways

conducive to implementation. There is evidence that accessing funding can be a necessary condition for an intervention to be implemented (Austin et al., 2011). However, these strategies are contingent on undertaking needs assessments and subsequently acting on what this assessment suggests—such as staff needs around ongoing training (Chambers et al., 2000; Evans et al., 2015; Goldenthal et al., 2021). Undertaking strategies within the remit of evaluation, such as developing monitoring systems and obtaining and using feedback explicitly, refer to the need to identify which existing data-collection structures are useful, need changing, or require de-implementation to support *efforts* (Mendenhall et al., 2013; Mouw et al., 2016; Ott et al., 2020; Sadjadi et al., 2021). At a surface level, strategies falling under the remit of interactive assistance, developing stakeholder interrelationships, and engaging consumers may appear to be less about structures and more about people. However, these socially oriented strategies also occur within structures and systems which act as facilitators and/or barriers to implementation (Alonge et al., 2020; Scaletta and Tejero Hughes, 2021). For instance, systems and structures are needed to involve pupils and families and obtain their feedback. This varies as it may leverage existing communication channels (van Kuijk et al., 2021) or form specific groups to allow involvement over time (Sadjadi et al., 2021). Evidence also suggests the importance of having a supportive system in place if professional development is going to follow a train-the-trainer model (Cane and Oland, 2015), with attendance at such professional development sessions sometimes seen as optional (Walker et al., 2022). Similarly, ongoing training and coaching needs time and resource allocation in advance to allow for this beneficial professional development strategy to be realised (Owens et al., 2019). Reminder systems can also leverage existing communication channels (Moore et al., 2021).

Summary

Enabling structures is a key context in implementation in education, evidenced in our realist review by 95 papers and rated as a review finding with high confidence. Enabling structures include school structures, systems and policies, like timetabling and data monitoring systems, and curriculum guidance and policy. It also includes resources including external funding and the availability of professional development. An enabling structure can be the roles that are supporting implementation and therefore the planning of implementation leadership across school staff. Time is also an important enabling structure appearing in a range of literature as both an enabler and barrier to implementation, particularly in relation to allocating necessary time to implementation actions and expectations regarding outcomes. Structures that are enabling, whether they are leveraged from existing systems or put in place to support implementation of a new approach, have been evidenced as impacting implementation outcomes including adoption, buy in, fidelity, costs, penetration, sustainability, and intervention outcomes including pupil outcomes. Enabling structures provides a context for, or is associated with, a range of broad implementation strategies. Strategies related to changing infrastructure and accessing funding indicate how putting in place enabling structures can benefit implementation. Strategies that relate to data monitoring often indicate or rely on the development and buy-in to a system for ongoing data collection and review of a new approach. Enabling structures can also help provide the conditions for some key ongoing implementation strategies such as train-the-trainer organisation of professional development, ongoing coaching, and team meetings amongst implementers.

Agents for change

'Agents for change' describes the conditions which allow people to enact change through expressing agency and helping others when implementing evidence-based practice in the school context. Agents for change can be individuals or groups at all levels of the school system who may take a role in the implementation effort. This can include champions, local opinion leaders, implementation team leaders and members, those delivering professional development, senior leaders, administrators, governors, and stakeholders who can express views such as children and families (Evans et al., 2015; Fixsen et al., 2005; Gale, 2020; Koh and Askill Williams, 2021).

Included studies

One hundred and seven of our 293 included papers provided evidence for agents for change as a context. Compared to the overall included papers, they were more likely to be reviews and less likely to be empirical studies applying a TMF. They were more likely to be U.S. based, more likely to be about teaching and learning interventions, and less likely to be about mental health interventions or to be focused upon teaching and learning interventions. They were more likely to be qualitative papers. The quality of these 107 was high, although this is likely because overall the qualitative research appeared to be less at risk of bias than other designs. As was typical across the programme theory elements, papers did not typically refer to 'agents for change' but we located literature that used both the term and agents of change when we searched for this. We do not have concerns about the relevance, rigour, and adequacy of the evidence used to develop our conceptualisation of agents for change; we located more evidence for this element of the programme theory than any other, although we do note that the evidence is weighted towards qualitative research. We are less confident in the coherence of this review finding because it is sometimes challenging to distinguish between agents for change as a condition that supports implementation and the actions of agents for change that can be considered under each mechanism. Therefore, we rate this element of the programme theory as moderate confidence according to the CERQual rating.

What is in scope

Agents for change can be key individuals, groups, or wider stakeholders. But to be an ‘agent for change’ key actors understand the role and value of agency, meaning they have choice over their actions and can express and model behaviours which influence others. Therefore, agents for change are not every actor involved in implementation. In this way, agents for change within the school context can empower others to also become agents for change (Gorard et al., 2016; 2017; Maxwell et al., 2019; Ott et al., 2020; Rose et al., 2017).

Agents for change broadly represent relational and complex contextual conditions. This means that they often involve too many unknowns and too many interrelated factors to be approached through predetermined rules and processes. This is different to the contextual conditions that sit within enabling structures, which although complicated, can often be approached systematically or procedurally. The interrelated factors present in the context of agents for change influence the nature and quality of social interactions and the real-time responses to behaviours or other stimuli that occur in implementation (Mouw et al., 2016; Rose et al., 2017; Wilhelm et al., 2021).

When the context of agents for change is supportive, agency is valued, voices shape engagement, and consistent participation underpinned by constructive dialogue and reflective processes, all generate greater depth and clarity around implementation (Koh and Askell-Williams, 2021; van Kuijk et al., 2021). Conversely, when the context of agents for change is inhibiting or constraining, tolerance, space, and curiosity for the expression of agency is low, compliance is valued, and voices may be heard but engagement is often shallow and not used to inform decision-making (Hudson et al., 2020; Trapani and Annunziato, 2018).

Examples of the contextual factors or conditions which sit within agents for change include:

- the nature of facilitation—e.g., around data gathering, training, support;
- degree of empowerment felt and experienced by agents for change and advocated for in others—e.g., around change and problem-solving; and
- degree of agency held and expressed—both individually and collectively.

The nature of facilitation refers to the ways in which members of the implementation team, school leaders, and wider stakeholders (e.g., those who may lead training and mentoring) plan, guide, and manage a group in order to reach shared goals (Hollingshead, 2009; Samdel et al., 2010; Savage, 2016; Wilhelm et al., 2021). Facilitation, as a contextual factor, implies using implementation leadership skills to influence group dynamics, cohesiveness around aims and actions, and degrees of involvement to support implementation and solve problems collectively (Foliano et al., 2019; Giraldo-García, 2021; Greaves et al., 2017; Hung et al., 2014).

Empowerment as a contextual factor in school-based implementation refers to the intentional processes in which agents for change respond to stimuli (Morrel-Samuels et al., 2017; Morse and Allensworth, 2015; Nelson et al., 2019). Evidence suggests that being an agent for change is both a mindset that individuals taking a lead in implementation can hold and a concept which helps us to understand the level of control which enables or inhibits decision-making, organisational functioning, and the quality of implementation (Chambers et al., 2020; Charlton et al., 2020; Ernst et al., 2009; Elsenburg et al., 2022).

Evidence also indicates that agents for change can obtain empowerment through successfully advocating for the intervention which is selected. Implementation leaders also go through processes of building trust amongst those school staff implementing an intervention, those receiving an intervention (e.g., pupils), and those who support or influence an intervention at distal levels (e.g., families, community, SEN specialists, local or national authorities) (Andreou et al., 2015; Davies et al., 2017; Neilsen et al., 2019; Silva et al., 2021). Empowerment is therefore shaped by relationships and conditions that are held both in and out of the immediate school context (Hollingshead, 2009; Roach et al., 2009).

Agency as a contextual factor refers to a perceived sense of autonomy that influences individuals and group’s ability to act on the world (Parsons and Adhikari, 2016). This can include stakeholders across the school context, for instance pupils and staff, as well as families and community (Judkins et al., 2019; Kaimal et al., 2016; Pearson et al., 2015; Robinson, 2019). Viewing teams or individuals across the school community as active participants in change reorients attention and energy on the potential of members of the school community to take a particular lead or express and build specific knowledge and skills at specific points along the implementation journey (Koh and Askell-Williams, 2021; Maxwell, 2019). This implies that at times school leaders may have to consciously both empower pupils and families, and to a certain extent disempower themselves as school leaders (Savage et al., 2011).

How does the evidence indicate outcomes?

The nature of facilitation (e.g., around data gathering, training, support) is evidenced to influence buy-in and shared responsibilities (Reezigt and Creemers, 2005; Tunks and Weller, 2009). Evidence suggests that it may be beneficial to encourage different individuals to assume an active leadership role and utilise their core strengths when needed supported by a transformative or distributed leadership culture (Grissom et al., 2021; Kong, 2019; Patterson et al., 2021). This was anticipated by Ryan Jackson et al. (2018) who noted that evidence was increasingly pointed towards

'leadership' not as a person but denoting different people engaging in different kinds of leadership behaviour as needed to facilitate implementation by introducing and sustaining new interventions and respond to changes in context.

The degree of empowerment felt and experienced by individuals and advocated for in others (e.g., around change and problem-solving) is evidenced to influence the degrees to which an approach is deemed acceptable, appropriate, and feasible, as well as the likelihood of longer-term commitment and momentum leading to sustainability and scale-up (Frigge et al, 2019; Gee et al, 2012; Pearson et al, 2015; Shoesmith et al, 2021). For example, agents for change can build trust between members of the implementation team and across the wider school community (MacDonald and Green, 2001). To be agents for change, school leaders need to be available, willing, and able to build trusting relationships and be seen as having high integrity to reinforce trust and so alleviate tensions (Elsenburg et al., 2022; Goodman-Scott 2017; Tyre 2017). Dissatisfied staff or community members can reduce trust (Goldring, 2015). For example, staff attrition impacts relationships with students, diminishes organisational memory, and the development of trust between school leaders and the community (Medina, 2019).

School leaders can often catalyse and organise those involved in implementation and can empower themselves and others, harnessing efforts and drawing agents together toward shared outcomes where ownership may shift from individual to collective. Leadership related to quality implementation practices understands this role as a facilitator of change, contributing to the development of plans that outline and respect local needs and accept a shared accountability for results (Ryan Jackson et al., 2018). School leaders may have site-based autonomy over curriculum and instruction, budgeting, staff, and the school mission to support successful implementation (Desimone, 2002; Hudson et al., 2020), however, effective implementation leaders also understand the bigger picture and recognise that long term sustainability of change includes and empowers staff (Chang, 2008; Sun, 2007).

Champions can be beneficial for generating early enthusiasm, coordinating activities, and disseminating information (Probart 1997; Crane et al., 2021). However, over-reliance on one or a few individuals may limit the depth of understanding among wider staff groups and subsequently limit fidelity to the intervention and long-term sustainability if key staff members leave (Firth, 2008 and Blaine et al, 2017). Staff turnover is also widely recognised as a barrier to sustaining momentum that can be created by agents for change (Judkins, 2019 and Wolk et al, 2019). The benefits of developing a shared responsibility among multiple agents of change is therefore needed to reduce individual workload and to build and utilise collective intelligence (Cheung Kong, 2019 and Grissom et al, 2021). Schools might therefore consider the team size and the range of roles that is most suitable for their context, balancing the strengths of larger teams in terms of diffusion and collective intelligence versus smaller teams with cohesion. Teams which allow workload to be viewed as a collective responsibility can create the conditions for stronger collaboration and co-operation, which can help to generate receptivity and sustainable engagement with an intervention over time (Leis et al, 2017).

The degree of agency held and expressed (both individually and collectively) across members of the implementation team and wider stakeholders is evidenced to influence implementation and pupil outcomes including buy-in, adoption, de-implementation, and scale-up (Hall, 2013; Icel et al, 2018; Leeman et al, 2018; van Geel et al, 2017). This is linked, for example, with implementer's involvement and engagement in test-driving and selecting practices which enable staff to pilot new practices and test drive their effectiveness to inform subsequent directions in practice (Cook et al., 2019). Building and facilitating internal and external interpersonal relationships and interactions that support the implementation process over time, can support and model greater degrees of agency which can help to generate implementation readiness, acceptance, security, sustainability, commitment, problem resolution, buy-in, and fidelity (Abu-Alghayth, 2020; Burriss, 2009; Derrington, 2013; Goldring, 2015; Guhn, 2009; Robinson, 2008; Schildkamp, 2019). While school leaders should take a genuine and active interest in implementation throughout to increase implementation quality and intensity (dosage) (Gorard et al., 2016; Hung et al., 2014; Robinson, 2008; Williams et al., 2021) there is a balance needed to not be intrusive, thereby enhancing rather than undermining working relationships (Jeffers 2010; Salvaterra 1998).

Agents for change is a contextual condition when members of the school community can shape involvement processes and subsequent outcomes. In constructive contextual conditions, consistent and deep participation and involvement underpinned by solution-oriented dialogue and reflective processes can generate greater depth and clarity around implementation (Koh and Askeel-Williams, 2021; van Kwijk et al., 2021). Conversely, in inhibiting or constraining contextual conditions involvement is likely to be more superficial. In such school contexts, tolerance, space, and curiosity for the expression of agency is low, compliance is valued, and voices may be heard but not be used to inform decision-making (Hudson et al., 2020; Trapani and Annunziato, 2018).

How does 'agents for change' as a context link to strategies?

Agents for change are indicated as having an important role supporting implementation in several strategies. This includes identifying and preparing champions, where individuals support others to implement a new intervention (Cane et al., 2015; Day et al., 2021), informing local opinion leaders who can influence colleagues to adopt a new programme (Allen et al., 2021; Asada et al., 2021; McLoughlin et al., 2022), and creating new practice teams who will have a range of skills and background to make it more likely that a new intervention is put into practice (Albers and Pattuwege, 2017;

Cannata and Nguyen, 2020; Fixsen et al., 2005; Robinson and Gray, 2017). Agents for change are therefore also important as part of the strategy to improve implementers' buy-in (Brann et al., 2021; Lohrmann et al., 2008).

The context of agents for change also provides the conditions for a range of other implementation strategies whereby key influential individuals are needed to give the strategy a chance to impact outcomes. The processes involved in conducting local consensus discussions, for example, require the active facilitation of collective inquiries around priorities and values to inform decision-making (Herlitz et al., 2020; Shoesmith et al., 2021; Tunks and Weller, 2009). Facilitating and modelling implementation and test-driving and selecting practices help implementation teams to make links between data, practice, and decision-making which builds a greater depth of understanding around what works and why (Durand et al., 2016; Reezigt and Creemers, 2005; van Geel et al., 2017).

The contextual conditions associated with agents for change that help to facilitate information including expertise, which is relevant across a range of professional development strategies. These strategies that will be led by an expert who needs to be credible and have the suitable skills and experience include make training dynamic, shadow other experts, and the provision of practice-specific supervision (Gregory et al., 2021; Kennedy et al., 2021; Zhang et al., 2023).

Several implementation strategies suggest the important role of school leaders as agents for change. While often it may be a range of implementation leaders who are facilitating others' contributions and empowering colleagues, we found that school leaders were often champions for an intervention or members of implementation teams (Cane and Oland, 2015; Dyssegard et al., 2017; Hudson et al., 2020; Leis, 2017). We also found evidence that school leaders providing supervision and modelling implementation can impact on fidelity and buy-in (McLoughlin et al., 2022; Simmons and Martin, 2016).

Summary

Agents for change is a second key context in implementation in education, evidenced in our realist review by 107 papers and rated as a review finding with moderate confidence. This confidence rating is not higher because it is sometimes difficult to distinguish where key individuals who are empowered and have agency are a condition that can be put in place or nurtured to support implementation that follows, or when the more direct actions by these key individuals are the mechanistic action that underlies effective implementation in schools. Agents for change as a contextual condition involves how empowered key individuals are in their role leading and practicing aspects of implementation, as well as the degree to which they can cultivate this in other actors they work with. Relatedly, it refers to the optimal level of agency and autonomy that is both held and expressed by individuals and groups and therefore how a range of important and representative individuals can shape implementation as it unfolds. Finally, agents for change are often individuals who are leading and supporting groups, often but not exclusively implementers, and not with formal school leadership roles.

Agents for change that fit this description are evidenced as impacting implementation outcomes including adoption, buy in, acceptability, sustainability, and intervention outcomes including pupil outcomes. Agents for change provides a context for a range of implementation strategies and some implementation strategies themselves indicate the type of agents for change that might be helpful for schools to put in place. Considering those individuals who can influence and/or support others in adopting new practices are important strategies. Agents for change can also lead on strategies and therefore make them more purposeful, strategies like consensus-building and deliberately improving implementers buy-in need to be coordinated by individuals who are empowered to use data collected and communicate with a range of colleagues. Other strategies indicate the importance of trainers, whether internal or external, and implementation team members being agents for change so that they can support or represent the range of individuals who may be implementing or affected by a new approach.

Intervention features

'Intervention features' broadly describe the characteristics of an innovation, why it is chosen, the ways it fits with the school context, including the schools needs and aspirations, and the ways in which it is put into practice. Intervention features as a context is diverse, and there is a range of evidence which suggests that certain features predict what strategies are important, which type of barriers or facilitators may emerge, and what types of outcomes are likely.

Included studies

Eighty-five of our 293 included papers provided evidence for intervention features as a context. Compared to the overall included papers, they were more likely to be reviews and less likely to be empirical studies. They were more likely to be EEF evaluation reports and therefore they were more likely to be U.K. based rather than from the U.S., again compared to all included papers. These papers were unlikely to be about behaviour as an intervention type and were more likely to include quantitative methods or process evaluations. Quality of these 86 papers was typical for the wider range of included papers. As for other programme theory elements, papers did not often refer to 'intervention features' but we located a couple of papers that used the term. We do not have concerns about the relevance and rigour of the evidence used to develop our conceptualisation of intervention features and we believe the review finding is coherent. However,

we hold minor concerns about the adequacy of the evidence representing the range of intervention features that we specify below. We would ideally like to locate more literature that shows the different between e.g. identifiable core components versus less identifiable, higher and lower capacity needs, more versus less measurable primary outcomes. Therefore, we rate this element of the programme theory as moderate confidence according to the CERQual rating.

What is in scope

The broad context of intervention features refers to the nature of an intervention and how this creates the conditions for the selection of implementation strategies, practices and processes which will be most appropriate. Contextual factors which sit within intervention features include:

- the core components of an approach—e.g., the essential, evidenced informed aspects of an intervention's procedure linked to developing positive outcomes;
- fit, feasibility, and adaptability—e.g., needs of pupils and other stakeholders, how resources including PD are perceived, procedural clarity, degree of adaptability, and flexibility;
- complexity of an intervention and its resources;
- evidence—e.g., reasoning and existing research evidence for an intervention;
- intervention-specific barriers and enablers—e.g. intervention knowledge, lack of intervention resources, adequate time allocated;
- capacity and capabilities—e.g., of those actors required to develop, deliver, and evaluate an intervention; and
- observable and measurable outcomes—e.g., can outcomes be clearly measured and seen.

'Core components' refers to the essential, evidence informed components of a given approach which need to be understood by implementers in order to be delivered with fidelity (Lord et al., 2017; Massey Combs et al., 2020; Ronto et al., 2020). It is this understanding of core components that is a contextual condition. For example, a physical activity intervention may require regularity in time and delivery for health benefits to be maximised (Pearson et al., 2015), or a behavioural intervention may require classroom rules, team membership, monitoring of behaviour, and rewards (Humphrey et al., 2018).

'Fit, feasibility, and adaptability' relates to contextual factors which shape the selection of an approach and subsequent ways that an approach needs to be tailored to work effectively within a particular school environment (Humphrey et al., 2018; Lander et al., 2019; Larson et al., 2021). When intervention characteristics provide a condition that is likely to support implementation, the intervention is clearly responding to a school priority, resources will fit well with current practice, the intervention is one that staff can see being used, and/or the intervention holds some flexibility to respond to the school setting (McNally et al., 2016; Nunes et al., 2018). For example, when teachers describe what successful adaptation looks like, they relate this having a good understanding of how the intervention helps to address a need or needs and being empowered to alter and adjust interventions in response to their knowledge of pupils, context, and their own professional judgement (Austin et al., 2011; Husain et al., 2019; O'Hare et al., 2018; Taylor et al., 2019; Waller et al., 2017).

'Evidence' refers to the research and development processes which have gone into creating and informing an intervention to address a particular need or needs and the ways in which this evidence is disseminated among school stakeholders (McLoughlin et al., 2020; Roy et al., 2018; West et al., 2017). Engaging the school community in research can be approached differently depending on needs and context but can include dissemination through training and knowledge exchange pathways (Pearson et al., 2015). Engaging with evidence dissemination has been linked to working more collaboratively with colleagues in other schools, improved understanding of how to use research evidence to improve practice, and improved support from senior leadership teams in using research evidence to improve teaching and learning (Gu et al., 2021).

Anticipating both intervention-related barriers and enablers is important in implementation. Enablers such as funding, designing some intervention components, and consistent staffing can be prioritised and inform the type of enabling structures and the actions of agents for change to support implementation (Austin et al., 2011; Lohrmann et al., 2008). When common intervention barriers including lack of knowledge about the intervention or lack of programme resources can be pre-empted (Dariotis et al., 2017; Simmons and Martin, 2019), this helps to maintain momentum and informs the use of flexible implementation strategies, such as tailoring strategies and facilitation and problem-solving. Differing attitudes about an intervention may indicate barriers or pinch points which could impact implementation (Fenton, 2002; Roach et al., 2009). Predicting barriers before they are experienced can be challenging but is also evidenced as being achieved by examining those experienced in the previous practice the new approach is superseding (Hudson et al., 2020), collaborating with other schools that have used the intervention and can share their journey (Leeman et al., 2018), and involving future implementers in planning (Fagen and Flay, 2009). Intervention-specific barriers are closely related to more generic implementation barriers such as staff turnover (Blaine et al., 2017; Dimova et al., 2021) and allocation of time to prepare for and deliver the approach (West et al., 2017). Challenges to implementation can therefore predict when features of an intervention become a pinch point and need additional support.

'Capacity and capabilities' are contextual factors related to a specific intervention which indicate what skills, time, and knowledge are required by implementers (Gorard et al., 2016; Grissom et al., 2021; Levin et al., 2013). Like resources, these conditions may be based on the perceptions and priorities of individuals and may or may not be informed by evidence. Capacity as a context also refers to the ways in which an intervention competes with other resources, interventions, and priorities in the school (Humphrey et al., 2020).

'Observable outcomes' are contextual factors which hinge on the extent that the intervention can provide measurable outcomes. Often these measures are associated with quantitative data, but they can also be measured qualitatively by observing practice, discussing processes followed, and listening to feedback (Knight et al., 2021; Maxwell et al., 2019; van Geel et al., 2017). What the observable outcomes are, and any tools available to measure them, inform implementation strategies about data collection.

The data collection tools and need for additional work as part of related strategies are determined by how simple/complex an intervention is, what observable outcomes are possible and how these can be measured, as well as how well specified an approach is, including its procedural clarity (Hung et al., 2014; Jarke, 2020; Kodish et al., 2020; Proctor et al., 2010). A simpler intervention may need less detailed data collection systems and will therefore be easier to measure, but only if this is allied with clear core components and known measurement tools. Equally, less complex interventions may not have the evidence base, procedural clarity, identifiable core components, or adaptability that means it will fit a school's particular priority. If an intervention is too complex, capacity, capability, and feasibility are likely to be reduced and therefore additional support will be necessary.

Intervention features are therefore a key context for implementation and an intervention's alignment to the school's underpinning values and vision is also fundamental (An et al., 2021; Gagnier and Fisher, 2020). Some features are predicted to more often lead to beneficial outcomes so implementation strategies are needed to respond to and support features of the intervention identified. The extent that an intervention is well-evidenced, the nature of accompanying resources and partnerships, as well as fit with current practice all interact to influence the extent that enabling structures and opportunities for agents for change support implementation (Leeman et al., 2018).

How does the evidence indicate outcomes?

Evidence suggests that intervention features are key contextual factors that help or hinder the implementation of evidence-based practice in various ways.

The core components of an approach (the essential, evidenced informed aspects linked to developing positive outcomes) are often those which are associated with generating positive outcomes including enhanced engagement and understanding (Austin et al., 2011; Fixsen et al., 2005; Leung et al., 2020). When an intervention has clear core components this can help schools to assess the areas where an intervention needs to be undertaken with fidelity and the areas where it allows sufficient flexibility to allow tailoring to different levels of pupils' physical, psychological, and social development and different levels of skill and experience (both of pupils and those who are delivering the intervention) (Dusenbury et al., 2003; Pearson et al., 2015; Shoesmith et al., 2021; Tancred et al., 2018).

An appropriate level of complexity, how well it addresses a need, how well resourced and how accessible resources are, are all contextual factors linked to a range of implementation outcomes including buy-in, readiness, and the level of understanding which is a prerequisite to fidelity (Hudson et al., 2020). The above resonates with the determinants of school improvement in relation to 'goals, pressure and support' proposed by Sun (2007) whereby schools are required to constantly manage the range of conditions which shape the nature and direction of improvement over time.

A mixed-methods case study conducted by Williams et al. (2022), for example, found that when an intervention is complex, but had procedural clarity, this led to particular implementation leadership behaviours including being proactive, knowledgeable, supportive, and perseverant regarding evidence-based interventions predicting stronger implementation climate and fidelity. The same study also described how implementation for autistic youth may be improved by distributing leadership, particularly as special educators and principals often have discrepant but complementary knowledge, experience, priorities, and perspectives. Conversely, a review by Roney and Daftary (2020) found an absence of conceptual clarity about an intervention was a barrier to implementation. In the context of restorative approaches, for example, the review found that misconceptions around whether restorative approaches were proactive or reactive undermined implementation efforts and reinforce a culture of control. Similarly, a review by Desimone (2002) of Comprehensive School Reform Models, found evidence that the more specific the intervention in terms of resources and guidance, monitoring and through its professional development, the higher the fidelity. The review found interventions providing specific materials, structured guidelines, and training to teachers were more likely to show beneficial pupil outcomes, and be put into practice more quickly, than programmes that were less well specified and relied on teachers developing materials. The evidence suggests a threshold in relation to complexity, where a certain amount is necessary to then necessitate specification of procedure, core components, and outcomes. However, too much complexity will challenge fit and feasibility and implementation outcomes such as fidelity and sustainability (Arnold et al., 2021).

Linked to complexity is the flexibility of an intervention. Humphrey et al. (2020) report in their evaluation of Achievement for All that the flexibility of this whole-school improvement programme may have been a reason why schools made less progress on pupil outcomes compared to control schools. Some case study schools reported that the flexibility made it difficult to recognise what the programme ought to look like in practice and see how it would lead to outcomes. This contrasts with Griggs et al. (2016) where the process evaluation about the intervention to promote use of research in teaching practice recommended flexibility for schools to tailor strategies to their own context to promote buy-in. It is clear that the flexibility of an intervention provides a key context, as greater support will be needed with tailoring an intervention in this case. There is also a tension between well-specified interventions that are likely to support fidelity and therefore pupil outcomes versus those that can be adapted and therefore are more likely to be adopted and be considered feasible (Reinke et al, 2021; Rowe et al, 2021). Alternate implementation strategies are implied, although there is evidence that adapting an intervention but respecting its core components can increase fidelity and therefore pupil outcomes (Merle et al., 2022; O'Hare et al., 2018).

Fit of an intervention can impact adoption as an implementation outcome. Austin et al. (2011) sought to identify barriers and facilitators to adopting a school-based physical activity intervention. In interviews they found that facilitators to adopting the intervention included a belief that the resources supplied as part of the intervention supported existing practice and were appealing, the intervention fit the school context, was considered easy to implement, and had external research evidence supporting its use. On the other hand, the availability of suitable resources can be a barrier to adoption (Hodgen et al., 2019).

When schools engage with the range of evidence which underpins an approach this is linked to increased fidelity (Albers et al., 2021; Koh and Askill-Williams, 2021; Maxwell et al., 2019). Fidelity is thought to increase because of developing greater understanding around how an intervention is designed to work, for whom, and in what types of context (Fixsen et al, 2005; Pearson et al, 2015; Ryan Jackson, 2018). Similarly, the more that implementation leaders can explain why an approach is likely to work and why it is likely to address a gap or need, the more staff buy-in to the intervention (Albers and Pattuwege, 2017; Ismail, et al., 2021; Trapani et al., 2018;). Applying evidence informed decisions can also help to build more sustainable and accountable implementation practice such as by reflecting on what drives variation in effects, i.e., under what conditions were effects positive or negative (Ruble et al, 2013; Albers et al, 2017; Leeman et al, 2018).

The selection and appraisal of evidenced informed interventions requires adequate training and ongoing professional development in these areas, which evidence suggests can be facilitated by local authorities or university research partnerships (Anderson-Butcher, 2016). Shared learning around critical appraisal of research evidence and how to explore feasibility in relation to individual context increases understanding of how to assess and appraise evidence effectively, which can help schools to select an approach based on its fit and feasibility to their context. When networks or outside agencies collated and shared resources around recent evidence, school leaders' capacities for engaging with evidence were strengthened (Goldenthal et al., 2021; Robinson, 2018). This indicates the presence of enabling structures (communication and knowledge exchange pathways) as well as agents for change (expressing agency and developing leadership capabilities), however, motivation to seek out and engage with evidence is still key (Beidas et al., 2012). Subsequently, this helps to improve recognition of the importance and value of evidence-based practice, aiding selection of appropriate interventions that fit the school's priorities for change, along with their context and community (Gorard et al., 2020; Leung et al., 2020; Maxwell et al., 2019). Where access to research findings is not straightforward, this can pose a significant barrier and reduce the likelihood of evidence informing the selection and uptake of appropriate interventions.

The absence of key intervention enablers such as professional development, programme resources, necessary staffing, and external funding represents intervention specific barriers that can be pre-empted before they affect implementation outcomes such as low receptivity of staff, poorer fidelity, and decreased motivation of implementers (Dyssegaard et al., 2017). There is also evidence that not pre-empting barriers or providing communication channels for implementers to note them can mean that barriers to delivering the programme are not addressed and approaches are not sustained (Fagen and Flay, 2009). Addressing intervention-specific barriers often implies the use of other components of the programme theory. For instance, adapting some elements of the intervention to overcome perceived barriers or achieve a better fit with existing practice (Leung et al., 2020; Reedy and Lacireno-Paquet, 2015) and a lack of knowledge about the intervention can hinder adoption and therefore imply the need for ongoing professional development (Simmons and Martin, 2009). It is important to learn from schools that have not sustained an intervention, both in relation to assessing feasibility but to also identify barriers in advance (Leeman et al., 2018). This can help to maintain fidelity (Moore et al., 2021).

Further to the points made above, evidence for the intervention's success in similar contexts should be shared with staff and community stakeholders to garner buy-in to the approach, its adoption, and optimise fidelity (Askill-Williams, 2013; Leeman et al., 2018; Maxwell et al., 2019). This might take the form of shadowing other experts delivering the intervention in other schools, although intervention features will determine how feasible this is (Desimone, 2002). The intervention will set the conditions of the capacity and capabilities needed by staff delivering an intervention as well as those who may be involved in developing or evaluating an intervention too. When support and advice on the development, delivery, and assessment of an approach is available from experienced users or intervention developers,

this is linked to buy-in as well as greater implementer self-reported wellbeing. For example, evidenced barriers to implementation include lack of supportive infrastructure, lack of training and support, lack of programme materials, inconsistent staffing, and inadequate upstream support at a regional or national level (Austin et al, 2011). The absence of upstream support systems has also been linked to poor implementation outcomes such as low receptivity of staff, poorer fidelity, and decreased motivation of implementers. This is thought likely to be due to the ways in which support structures give validity to an intervention (Dyssegaard et al., 2017).

How do intervention features as a context link to strategies?

The context of intervention features provides the conditions for a wide range of implementation strategies. The strategy 'promote adaptability' requires exploring and examining the evidence about the fit of an approach as well as the core components which are linked most closely to delivering with fidelity (Herlitz et al., 2020; Shoesmith et al., 2021; Tancred et al, 2018). Developing a detailed implementation plan is also going to be largely determined by intervention features, such as who is involved, timescales, and outcomes sought (Frigge et al., 2019). Evidence suggests that planning helps specify and understand core components of an intervention (Alonge et al., 2020).

The core components of an intervention set the conditions for some evaluative and iterative strategies. These include developing instruments to monitor core components (Gagnier and Fisher, 2020) and the related strategy which shares data about fidelity to core components with implementers (Robinson and Gray, 2019). Professional development through educational outreach visits can help to unite knowledge by providing the opportunity to develop understanding about the intervention, which can add credibility to an approach (Alonge et al., 2020; Bingham et al., 2018; Goldstein et al., 2015). Local technical assistance, coaching, and champions in a school setting that can provide advice and help implementers problem-solve and therefore mitigate any issues with complexity and feasibility can help address known barriers about an intervention (Baffsky et al., 2023). Educational materials may already exist for some interventions but will often need tailoring to the needs and circumstances of the school to impact how accessible and useable they are (Calvert et al., 2020; Chen et al., 2018; Dariotis et al., 2016). Strategies associated with staging implementation scale-up rely on having observable outcomes from piloting or initial phases of intervention delivery (Austin et al., 2011; Comiskey et al., 2015; Crawford et al., 2020). Pruning competing initiatives can also be an important strategy when other demands are a barrier; this can include when there is a lack of perceived fit between a new teaching and learning intervention and the existing curriculum (Allison et al., 2018). This is also linked to allowing the necessary time for implementing the intervention.

Summary

'Intervention features' is the final context in the refined programme theory, evidenced in our realist review by 85 papers and rated as a review finding with moderate confidence. Although a wide range of evidence spanning different types of intervention informs this analysis, there are a wide range of important intervention features and there is not always a solid evidence base to confidently state the impact of some of the features known to be associated with implementation and pupil outcomes or to always be able to specify the level of complexity, clarity, or fit that may be optimal. Intervention features that are important in shaping the response to implementation include the core components of an approach, how it fits with the school context, how adaptable the approach is, and, relatedly, the extent to which adaptations ought to be encouraged, complexity of the approach, the evidence that supports the impact of the approach, existing capacity to put the new approach into practice, and the extent to which meaningful outcomes can be measured in the short- or medium-term.

Positive intervention features as indicated can help improve several implementation outcomes, particularly fidelity, but also adoption, buy in, and broader sustainability related to implementation climate that can be applied across future implementation. It is important to note the relationship between core components, fidelity, and the intervention feature of adaptability: if an intervention is highly adapted this may well lower fidelity to core components. It is less meaningful to consider intervention outcomes as impacted directly by this context given that often the consideration of intervention features leads to the selection of the most appropriate approach and any comparison of different interventions in research literature is unlikely to indicate whether it was the core components, clarity, or adaptations made that explain any different outcomes. The importance of carefully considering some of the intervention features indicated is shown in their place in several implementation strategies, such as promoting adaptability, monitoring core components, and whether materials need to be developed. Other strategies draw on analysis of intervention features such as developing an implementation plan and decisions about the extent of professional development, coaching, and supervision. Finally, a range of strategies can help improve the fit and feasibility of an approach, notably de-implementing existing practice.

Mechanisms

In the next sections we describe the three core mechanisms of the programme theory: uniting, reflecting, and engaging. Mechanisms differ to contexts as they are active processes rather than conditions. Mechanisms are the underlying processes that are generated in the presence of contextual conditions or factors. Mechanisms lead to a range of outcomes which can be anticipated or unanticipated.

Uniting

'Uniting' encompasses the underlying processes which align and cohere the people involved in implementation with each other and in relation to the intervention itself. The marker of uniting that drives outcomes are when actions bring alignment, either between those actors involved in implementation or between the stakeholders involved in implementation and the intervention or the wider implementation effort.

Included studies

Sixty-four of our 293 included papers provided evidence for uniting as a mechanism. Mechanisms tend to have less papers evidencing them compared to contexts given the evidence needs to show this construct underlying implementation action and driving outcomes. Compared to the overall included papers, they were more likely to be reviews and less likely to be an EEF evaluation report. They were more likely to be focused on physical health as an intervention and less likely to be reviews that included any intervention. They were more likely to be mixed-methods but were less likely to refer to their methods as a process evaluation. Quality of these 64 papers appeared typical for the wider set of included papers. Papers very rarely referred to 'uniting' as a term directly, but did often indicate that aligning or sharing knowledge, understanding, and values was occurring. We do not have concerns about the relevance, rigour, and adequacy of the evidence used to develop our conceptualisation of uniting. We are also confident in the coherence of this review finding, although acknowledge that much of the evidence shows uniting knowledge, understanding, and values as driving outcomes rather than views and practice. Therefore, we rate this element of the programme theory as having high confidence according to the CERQual rating.

What is in scope

Our realist evidence synthesis showed that 'uniting' includes uniting:

- views—e.g., about an intervention and implementation;
- values—e.g., why is this important to staff and their school;
- knowledge and understanding—e.g., about implementation and, in particular, the intervention; and
- implementation practices—e.g. uses of data to inform decision-making.

'Uniting views' captures the ways in which actors, which can be agents for change, seek to gather opinions and develop consensus around needs and potential approaches (Asada et al., 2020; Herlitz et al., 2020; Shoesmith et al., 2021). Where views differ it is the process of acknowledging difference, exploring common aims, addressing concerns, and examining the risks and benefits of taking action that help to unite views, meaningfully involve stakeholders, and gather momentum (Roach et al, 2019; Gaias et al, 2021; Allen et al, 2021).

'Uniting values' captures the underlying priorities, beliefs, and motivations of members of the implementation team and school community (Durand et al, 2016; Husain et al., 2019; Leung et al, 2020; Moore et al, 2021; Savage, 2011). A key element here is consensus on why the area of need, and the intervention selected to address it, is felt to be a priority by a range of actors in the school (Alonge et al., 2020; Frigge et al., 2019). Aligning these values is important as these elements are thought to drive choices and patterns of behaviour which have the potential to strengthen or undermine implementation (Cane and Oland, 2015; Reedy and Lacireno, 2015; Alonge et al, 2020).

'Uniting knowledge and understanding' incorporates the processes which implementation teams and the wider school community undertake to exchange, disseminate, and make sense of an approach and its role within the school community (Burris and Ring, 2009; Samdal and Rowling, 2011; William et al, 2021). This aspect of the mechanism includes developing knowledge and understanding about the intervention, associated practice, and therefore professional development as a strategy to achieve this (Austin et al., 2011; Guhn et al., 2009; Sims et al., 2021). Uniting understanding can equally be about how the intervention is perceived to—and then does—address priorities in the school setting (Blaine et al., 2017; Freeman et al., 2014). As well as developing knowledge and understanding about the intervention, evidence suggests increasing understanding of implementation across a range of staff is beneficial (Albers and Pattuwege, 2017; Brown and Vargo, 2014; Sichel and Connors, 2022).

'Uniting practice' refers to the ways in which staff come together to deliver and reinforce an approach, this can be through implementation teams and key individuals sharing and disseminating data to inform decision-making and help cohere intervention delivery (Fletcher et al., 2014; Metz et al., 2020; van Geel et al., 2017). This can also involve co-operation, collaboration, and peer mentoring and other support strategies which seek to align and strengthen consistency (Asada et al., 2020; McLoughlin et al., 2022; Wolfenden et al, 2017).

How does the evidence indicate outcomes?

Evidence suggests that uniting is a mechanism which generates a range of outcomes when implementing evidence-based interventions. We use the term 'uniting' as evidence points to the ways in which certain processes, practices, and behaviours act to cohere, align, and share values, understanding, knowledge, and practice amongst members of the school community during implementation.

When uniting views, evidence suggests the process of acknowledging difference, exploring common aims, and examining the risks and benefits of either acting or not can help to generate feasibility by helping to weigh up the pros and cons of a new approach over established practice (Frigge et al., 2019; Gee et al., 2012; Pearson et al., 2015). Uniting views helps to generate greater acceptability, buy-in and, in the long run, greater chances of sustainability by acknowledging the perspectives and professional opinions of staff as well as by encouraging the involvement of key stakeholders such as pupils and families (Reezigt and Creemers, 2005; Ronto, 2020; Sadjadi et al., 2021; Tunks and Weller, 2019).

Uniting values by exploring and examining priorities, beliefs, and motivations amongst those who undertake implementation is linked to buy-in through the way in which it identifies disparities and potential pinch points which can be discussed and mediated (Cooper et al., 2015; Frigge et al., 2019; Leadbeater et al., 2015). Uniting values is therefore aided by some intervention features, such as feasibility and known barriers. Uniting values is also linked to adoption and increased fidelity; these outcomes can be generated by acknowledging and acting on preferences and professional judgement, which increases implementer's ownership over an approach and longer-term commitment (Gabby et al., 2017; Hollingshead, 2009; Hall, 2013;). Evidence also suggests that a school leader's willingness to alter their own values in response to new evidence is also key (Robinson, 2017).

When uniting knowledge and understanding, evidence suggests that schools can generate greater degrees of alignment and support by sharing information, targeting buy-in to an approach, and informing families of the ways in which they can help to support and reinforce new practice at home (Lord et al., 2018; Mouw, 2016; van Kuijk et al., 2021). Similarly, uniting knowledge and understanding can elicit misconceptions and alleviate concerns by helping to communicate to implementers why and how implementation is thought to work, the evidence behind it, as well as the ways in which it might be delivered with a balance between fidelity and adaptability (Durand et al., 2016). This was found to be the case particularly in health-related approaches such as vaccinations (Golden et al., 2014) and sex education (Schutte et al., 2014; Strange et al., 2006). Professional development is a key strategy used to unite knowledge and understanding about a new intervention. This can impact adoption, buy-in, and fidelity to the intervention. Evidence suggests that the underlying driver of this increased knowledge and understanding can differ, including expert instruction (Freeman et al., 2014), modelling the intervention in the relevant school context (McBride et al., 2002), a focus on overcoming likely barriers (McHale et al., 2022), and through reminders about key aspects of the intervention (Dariotis et al., 2017).

There is a link between uniting values and understanding. Cohering understanding of the school's plans for implementation can help staff buy in to the intervention, through understanding how the intervention will address the school's needs and therefore bring value (Veel and Bredhauer, 2009). This is also shown to be data driven as well as connected to processes of assessing needs and how well an intervention is improving outcomes.

Evidence suggests that uniting practice is often linked to the collection and leveraging of data through open and critical conversations which seek to establish what practices are being undertaken, how, and what impacts this is having on pupils (Gabby et al., 2017; Kilgallon et al., 2008). Aligning practice is linked to greater degrees of consistency and penetration as well as the likelihood that data is relayed in a timely and appropriate manner to pupils. Feedback to pupils is key to ensuring ownership and accountability for these important stakeholders as well as helping pupils to see the impact of their continued involvement (Scaletta and Hughes, 2021).

Evidence suggests it may also be useful to examine the relative value placed on certain areas of the curriculum and how this can influence implementation choices and uptake. For example, studies report that lower value placed on health versus academic achievement in some educational structures and systems can be a barrier to effective implementation of health-related approaches (Hung, 2014; Langford et al., 2015).

How does uniting as a mechanism link to strategies?

'Uniting' is indicated across many implementation strategies. Some areas refer strongly to the ways in which understanding, values, or skills need to be aligned to develop coherence among implementation practices. Professional development strategies all aim to unite knowledge and understanding about a new intervention or implementation more generally and therefore impact on fidelity (Brock and Carter, 2017; Guhn et al., 2009). Some of the individual professional development strategies indicate how other mechanisms can drive PD outcomes, such as dynamic training (engaging) and ongoing training (reflection).

'Develop evaluative and iterative strategies' (Cook et al., 2019), for example, includes the development of an implementation plan or blueprint. This process involves strategies which aim to build collective understanding around aims and objectives which will guide the implementation process over time (Durand et al., 2016; Savage, 2011; Stewart et al., 2008). Other strategies focused on assessment and monitoring are effective when they are uniting implementation practices around the use of data (Hall, 2013; Reezigt and Creemers, 2005; Tunks, 2009). Developing coherence around these touchstones of implementation requires many of the strategies falling under 'develop stakeholder interrelationships', with 'conduct local consensus discussions' implying that uniting staff and stakeholders in discussions that establishes the school need as important and the intervention appropriate (Herlitz et al., 2020; Reezigt and Creemers et al., 2005; Shoesmith et al., 2021). Related to this, improving implementers' buy-in suggests an endpoint

where there is an increased coherence around an approach as important and viewed positively (Guhn, 2009). This is also the case when local opinion leaders are influencing colleagues to adopt a new intervention, helping to unite staff in valuing the intervention (Atkins et al., 2008; Drmic et al., 2017). These strategies involve processes of generating shared knowledge, understanding, and skills which can be used to inform and strengthen decision-making throughout implementation (Asada et al., 2020; Frigge et al., 2019; Gee et al., 2012).

The strategy 'facilitation and problem-solving' encompasses a range of the aspects of uniting that are in scope. It implies interactive problem-solving and therefore uniting views about an intervention (March et al., 2016); it also shows an important area of implementation practice in terms of decision-making around identified problems (Schildkamp et al., 2019).

Summary

'Uniting' is an important mechanism in implementation in education, evidenced in our realist review by 64 papers and rated as a review finding with high confidence. Actors involved in implementation in schools can benefit from uniting around several internal processes and shared practices. This includes uniting views about both the new approach and implementation more generally: this seeks to acknowledge and address any differing views and concerns to help ensure buy in. Uniting values is related but focuses upon consensus about the importance of the approach and the priority it addresses. Uniting knowledge and understanding often refers to developing this in relation to the approach, although this mechanism can underlie a range of modalities of knowledge building, including professional development. While this helps unite practice, evidence shows that it is also important to unite practice in terms of key implementation actions, such as professional development and data collection. It implies decisions are made and shared so the purpose of implementation processes is clear and aligned with views and values.

Uniting views, values, knowledge, and practices is indicated to impact implementation outcomes including adoption, buy in, fidelity, and sustainability. Uniting is a mechanism that demonstrates how a range of broad implementation strategies can be effectively used. Strategies related to professional development aim to unite knowledge and understanding about a new intervention or implementation more generally and therefore impact on fidelity and therefore often go on to impact pupil outcomes. Strategies that develop stakeholder relationships are often seeking to generate buy-in and often through building consensus about needs or the value of a new approach. Facilitation and problem-solving is a strategy that benefits from having uniting views and practice at its core. Addressing issues and responding to barriers can help to unite and even reunite views and practice in line with established shared values about implementation.

Reflecting

Our realist synthesis indicates that reflecting is a key mechanism in school-based implementation. Evidence suggests that reflecting often underlies the nature of thinking in relation to implementation and an intervention, including the speed and depth of thinking and decision-making. Reflecting underlies decision-making, the ways in which data is interpreted and used, and informs the ways in which staff understand progress. Key to reflection driving outcomes is not necessarily elaborate, critical reflection, rather it is opportunity, capacity, and a shared responsibility to question and shape change in an ongoing way.

Reflecting can take place individually and in groups, within the programme theory it refers primarily to two interwoven processes:

- reflecting as a daily practice—occurs in the shorter term, e.g., choosing to reflect to help to respond to stimuli rather than reacting to it during group discussions or during delivery of approach; and
- reflecting as a process of inquiry—occurs over the longer term, e.g., reflecting on journey and how things evolve over time, including critically considering adaptation, revisiting plans, and data-informed decision-making as a process.

Indicated above is a distinction between reflecting upon something, often the intervention or implementation actions, and tools for reflection, which can range from data-informed decision-making to reflecting upon plans and intervention resources. Reflecting as a process that drives outcome implies capacity for this reflection and that the reflection is valued.

Included studies

Seventy-one of our 293 included papers provided evidence for reflecting as a mechanism. Compared to the overall included papers, they were more likely to be empirical papers applying a TMF and less likely to be reviews. They were more likely to be focused on teaching and learning and behaviour interventions. They were less likely to be qualitative papers or refer to their methods as a process evaluation. Quality of these 71 papers appeared typical for the wider set of included papers. Papers more often referred to 'reflecting' as a term directly compared to other programme theory elements, but this was also often implied in the use of data, monitoring, and identification of barriers in papers. We do not have concerns about the relevance, rigour, and adequacy of the evidence used to develop our conceptualisation of uniting. We are also confident in the coherence of this review finding, although acknowledge that relatively less evidence

shows reflecting on needs as driving outcomes directly, compared to other examples of reflection that are in scope. Therefore, we rate this element of the programme theory as having high confidence according to the CERQual rating.

What is in scope

Reflecting on something or using something as a stimulus for reflection, can take place in various ways throughout implementation, including reflecting on:

- needs;
- fit and feasibility;
- facilitators and barriers
- implementation and intervention outcome data; and
- feedback.

'Reflecting on needs' includes individual as well as group and school-level needs throughout all stages of implementation spanning selecting, preparing, adapting, and maintaining an approach. Reflecting on needs helps to identify areas for growth which require specific support and attention (Ryan Jackson et al., 2018; Samdal et al., 2010; Tunks and Weller, 2009).

Closely linked with the context of intervention features, 'reflecting on the fit and feasibility' of an intervention is an example of reflection as an ongoing process across phases of implementation. This reflection can be linked to needs in terms of which intervention might fit those needs and be feasible for the school setting (Leis et al., 2017; Trapani and Annunziato, 2018). But it can also be in relation to 'reflecting on barriers and facilitators' for the intervention (Hudson et al., 2020), including what may need to be adapted about the school context or the intervention so that what has worked in other settings can fit in the current school (McBride et al., 2002). Later, this reflection about feasibility can inform decision-making about decisions to scale up an intervention or not (Bogiatzis-Gibbons et al., 2021).

'Reflecting on facilitators and barriers' by listening, observing, and considering the perspectives of the implementation team or wider school community helps to acknowledge challenges and inform the development of effective support structures and strategies (Moore et al., 2021; Miller et al., 2015; Zhang et al., 2021). Evidence shows that it is important that a range of representative stakeholders are involved in assessing barriers (Arnold, 2021). This shows the importance of both engaging as a mechanism (discussed next) and reflecting. Collective reflection that can identify barriers and needs across a range of actors can help actively tailor implementation processes. It implies the need for structures to collect this data.

'Reflecting on data' refers to the various forms of information which get collected in schools. When analysed contextually and approached critically, this data helps implementers to draw a configurative understanding of what's working, for who, when, in what circumstances, and why in relation to implementation (Dyssegaard et al., 2017; Schildkamp et al., 2019; van Geel et al., 2017).

'Reflecting on feedback' informs procedure, practice, and behaviours. For example, implementers receiving feedback from mentors or coaches and pupils receiving feedback from teachers (Botvin et al., 2018; Fallon et al., 2018; Weiland et al., 2018). Reflecting in this capacity shows the iterative nature of many implementation strategies which often need to be returned to periodically, such as planning and needs assessments (Bishop et al., 2015; Dariotis et al., 2017; Dimova et al., 2021).

How does the evidence indicate outcomes?

'Reflecting on needs' is evidenced to influence a range of implementation and pupil outcomes including attainment, fidelity, adaptation, buy-in, and readiness (Austin et al., 2011; Bogiatzis-Gibbons et al., 2021; Crawford et al., 2020; Moore et al., 2021). School leaders' capabilities and capacities to examine not only what priorities have emerged but what actions or conditions led to the priorities emerging are considered an influential element of implementation. Applying greater degrees of criticality helps to facilitate inquiry into the series of events that influenced the development of a specific area of need, which is indicated to lead to greater degrees of adoption once an intervention is selected that addresses the need (Ryan Jackson et al., 2018). Inquiry enables degrees of strategic pragmatism in the sense that examining why a priority has emerged could lead to establishing what previous or existing practices may have slowed, stalled, or inhibited progress due to inefficiency or ineffectiveness (Fernandez et al., 2019). Awareness of these factors, not only strengthens critical thinking around implementation but could be drawn on to inform next steps and decision making, contributing to improvements in the overall quality of implementation.

'Reflecting on the fit and feasibility' of an intervention can help to ensure that the right intervention is selected to address the need and that there will be buy-in (Silva et al., 2021). Modifying an intervention to respond to views of stakeholders can also impact buy-in, but also maintain this level of reflective participation as the intervention is introduced and fit and feasibility is reflected upon again (Frigge et al., 2019). As such, reflection on fit and feasibility over time can improve both adoption and sustainability (Connors et al., 2022; McBride et al., 2002; Merle et al., 2022). Reflecting on how an intervention might be adapted, while maintaining fidelity to core components, has been shown to increase acceptability

of a programme (Freeman et al., 2014). This can also be linked to reflecting on barriers as often barriers revealed through processes of reflection link to perceived fit of the intervention (Cassar et al., 2019).

'Reflecting on facilitators and barriers' by listening, observing, and considering the perspectives of the implementation team or wider school community helps to acknowledge challenges and inform the development of effective support structures and strategies (Bingham et al., 2018; Comiskey et al., 2015; Herlitz et al., 2020; Michael et al., 2019;). All staff members involved in an intervention in practice may need to make judgements about how well it fits with their context and how to appropriately adapt it to support student outcomes. The ability to reflect and make an informed, contextually appropriate decision is captured by the term 'intelligent adaptation' (Mohammed et al., 2008). This requires individuals to undertake a deep, reasoned, and evidence informed thinking approach towards implementation (Hollingshead, 2009; Roach et al., 2009; Trapani and Annunziato, 2018). Evidence shows that by addressing barriers fidelity can be improved (Goldenthal et al., 2021; Livet et al., 2018).

'Reflecting on data' is evidenced to be instrumental in understanding pupil progress and the ways in which an intervention is being delivered with fidelity (Anderson-Butcher et al., 2016; Robinson and Gray, 2019; Trapani and Annunziato, 2018). Developing insights and greater understanding can bring about informed decision-making and intelligent adaptations to interventions which correspond to individual and community capacities, capabilities, and motivations (Martinez, 2016). Reflecting can express agency and autonomy among school stakeholders, which informs data-based decision-making (van Geel et al., 2017) and buy-in and readiness to undertake implementation (Ryan Jackson et al., 2018). This indicates agents for change as a necessary condition, whether this is empowering a wide range of people to reflect on data in an ongoing way or key agents for change, such as implementation team members, who will use the collected data to make decisions. The integration of reflecting within known implementation strategies may influence behaviour change and improve fidelity. Therefore, helping to support the initiation, development, and sustaining of reflective processes are fundamental to the overall penetration and fidelity of an evidence-based intervention (Larson et al., 2021; Silva et al., 2021).

Moreover, developing reflective processes among school community members may influence the sustainability of an approach. Sustainability in relation to the implementation of evidence-based interventions is not an endpoint, it is a dynamic process which transforms the community over time as adaptation, capacity building, emergence, and evolution interact to influence attitudes, habits, and behaviours (Shelton et al., 2018). This further supports the idea that implementation and change in schools is a non-linear approach, where the complex whole is greater than the sum of its parts (Koh and Askill-Williams, 2021; Rickerson et al., 2021). Reflection, and the ways in which it can facilitate and support a depth and breadth of thinking in relation to implementation among stakeholders, can also play an instrumental role in sustainability in the school context by encouraging meaningful connection between how an approach influences and is influenced by a range of factors across school systems (Koh and Askill Williams, 2021).

Reflecting on feedback is evidenced to work in several ways. Reflecting can facilitate intention and purpose through targeted inquiry, which aims to examine why a specific priority area has emerged (Andreou et al., 2015; Goldenthal et al., 2021; Markette et al., 2013). This enables energy to be directed toward learning from the past, which could subsequently preserve, maintain, and sustain buy-in in the longer term by helping those involved to anticipate and understand challenges and focus energies on managing and mediating these effects (Gabby et al., 2017; Judkins et al., 2019; Leung et al., 2020; March, 2020). An example where action taken after reflecting on feedback aided sustainability is given by Savage et al. (2011): reorientation of efforts toward a new whole-school behaviour approach helped to address where data showed teachers were inadvertently undermining implementation through approaches to behaviour management where they were often drawn too far out of habit, comfort level, or previous experiences.

A range of studies also suggest that reflecting on feedback with a colleague or expert in a coaching role supports fidelity, Noell et al. (2013) in their meta-analysis identified that it was the review of data in particular that supported fidelity. Self-monitoring is another way in which reflection on feedback can be operationalised. Again, this supports fidelity as an outcome (Oliver et al., 2015).

How does reflecting as a mechanism link to strategies?

Reflecting is indicated explicitly and implicitly across many recognised implementation strategies (Cook et al., 2019). For example, reflecting plays a key role in many evaluative and iterative strategies which seek to acknowledge and respond to developing needs and outcomes generated from implementation actions and processes (Hudson et al., 2020; Maxwell et al., 2019; Roach et al., 2009). More specifically, strategies that involve the use of assessments suggest that reflecting on data is key. This includes assessments across implementation phases, such as local needs assessments (Durand et al., 2016), developing instruments to monitor core components (Goldenthal et al., 2021; Schildkamp et al., 2019), and sharing fidelity data (Kennedy et al., 2021). Reminders that prompt delivery of core components also allow for reflection on any gaps between actual and ideal practice (Oliver et al., 2015). In local needs assessments, when staff can explore why particular needs have emerged and what factors, either positive or negative, have contributed to these needs emerging, they are able to understand better the links between the school context, behaviours, and outcomes and how the intervention will specifically address needs that have arisen (Hudson et al.,

2020). Likewise, evaluating the school environment to consider changing or altering aspects of it involves reflecting about the fit and feasibility of the intervention (Merle et al., 2022).

Reflecting is important in relation to decision-making about scaling up, sustaining, and potentially de-implementing interventions in practice. Strategies involving reflection focus on test-driving, scale up, and pruning competing initiatives. While they also provide a platform to unite values around the progress with an intervention, they show the importance of reflecting on intervention features and reflection informing planning (Comiskey et al., 2015; Gunderson et al., 2021; Savage et al., 2011; Tunks and Weller, 2009).

Strategies connected with peer assisted learning, teamwork, and ongoing training/coaching are linked to reflecting due to the ways in which they involve exploring and examining areas for growth, successes, and challenges associated with implementation over time (Desimone, 2002; Evans et al., 2015; Goldenthal et al., 2021; Samdal et al., 2010). One strategy specifies that reflection is part of the purpose of organising meetings between implementers, which can aid sustainability when this is supported over time (Andreou et al., 2015; Guhn et al., 2009). Shadowing other experts allows for reflection about the fit and feasibility of an intervention within staff's own setting and can include reflective discussion about barriers and adaptations made where the intervention has been sustained (McBride et al., 2002). Furthermore, tailoring implementation strategies to address barriers requires reflection on earlier data collection (Cannata and Nguyen, 2020; Schildkamp et al., 2019; van Geel et al., 2017).

Summary

Reflection is a key mechanism in implementation in education evidenced in our realist review by 71 papers featuring prominently across both the initial and refined realist programme theories and rated as a review finding with high confidence. Reflecting can take place individually and in groups, the realist synthesis suggests two related processes underlie effective implementation. Firstly, reflection as a more individual and ongoing practice, which can include reflecting on feedback received from intervention recipients or those in a coaching or supervision role, including peers. Secondly, reflection can be a process of inquiry that is woven into implementation as a process and therefore demonstrates how reflection leads to more fundamental decision-making, such as increasing support, adaptations to an approach, and, at times, decisions to de-implement. Reflection underpins implementation both in relation to thinking about a new approach and the use of tools such as plans, data collection, and ongoing coaching effectively to learn from and improve implementation.

Reflecting on needs, the fit and feasibility of an approach, barriers and facilitators to implementation, and on data shows this mechanism working across phases of implementation and is therefore indicated to impact implementation outcomes including adoption, buy in, fidelity, adapting an approach, sustainability, and pupil outcomes. Reflecting is a mechanism that underpins how a range of broad implementation strategies can be employed effectively. It plays a key role in many evaluative and iterative strategies which seek to acknowledge and respond to developing needs and outcomes. As reflecting on data is key, those strategies that involve evaluating data show the importance of reflection. It is also important in relation to strategies that may be used later in the implementation process, particularly around scaling up and whether to sustain an implementation, although this is seen early in the implementation process when piloting an approach and determining how to de-implement previous practice. Other implementation strategies bring together staff for the purpose of learning and reflection. Reflecting underlies decision-making, the ways in which data is interpreted and used, and informs the ways in which staff understand progress. Key to reflection driving outcomes is not necessarily elaborate critical reflection, rather it is opportunity and capacity for ongoing evaluation that informs change.

Engaging

The programme theory mechanism of 'engaging' captures the ways in which school personnel involved in implementation and the wider school community respond, relate, and are included in implementation. Examples of ways of engaging include collaboration, communication, dissemination, and the opportunity to share knowledge and skills. It also relates to participation and some elements of motivation related to implementation. As for the other mechanisms, our realist synthesis suggests that staff and wider school stakeholders, including pupils and families, are only engaged in a way that benefits outcomes in the right context. As for reflecting, opportunities for engagement need to be meaningful.

Included studies

Sixty-four of our 293 included papers provided evidence for engaging as a mechanism. Compared to the overall included papers, they were more likely to be empirical papers applying a TMF and less likely to be EEF evaluation reports. They were more likely to be focused on mental health and less likely to be focused on any kind of intervention. They were more likely to be qualitative papers. Quality of these 64 papers appeared typical for the wider set of included papers. Papers sometimes referred to 'engaging' as a term directly, but this was often in relation to involving the wider school community than other examples of engaging in scope. We do not have concerns about the relevance and rigour of the evidence used to develop our conceptualisation of engaging. We have minor concerns about the adequacy of the evidence in relation to the elements of engagement that appear to be more directed. While we found ample evidence

for the importance of motivation and buy-in, we found surprisingly little evidence for ideas like mandating change and engaging implementers through incentives. We are also relatively confident in the coherence of this review finding, although acknowledge that there is some potential overlap between engaging in collaboration and engaging interest in an intervention and other mechanisms—collaboration may involve reflection and increased interest in an intervention may also unite values about the intervention too. Therefore, we rate this element of the programme theory as having moderate confidence according to the CERQual rating.

What is in scope

The mechanism of engaging refers to:

- engaging voices;
- engaging in co-operative and collaborative processes; and
- engaging interest and investment in the intervention and implementation.

'Engaging voices' occurs when communication structures can provide a range of stakeholders with the opportunity and potential to share their perspectives, concerns, and questions (Cane et al, 2015; Crane et al, 2021; Humphrey et al., 2020; Quintanilha et al, 2013). Engaging voices also refers to eliciting feedback to include and involve people. This can vary between discrete communication between members of an implementation team and therefore the use of clear pathways that involve all the team, or mechanisms that collect feedback and involve those affected by, and who can support, implementation, including pupils and families. Engaging also includes processes of consultation, e.g., driven by implementation leaders around the feasibility and acceptability of an approach, as well as around potential adaptation (Andersen et al., 2010; Motamedi et al., 2020; Roach et al., 2009).

'Engaging in co-operative and collaborative processes' refer more broadly to the ways in which schools establish team working to support implementation efforts (Chambers et al., 2020; Freeman et al., 2014; Morrison et al., 2019). This can involve designated teams with a range of key stakeholders that plan and review the implementation of a new intervention in the school setting, or implementers supporting each other. It may also involve more ad hoc collaboration where champions may support colleagues. Collaborative exchanges build reciprocity, which is important as this can facilitate knowledge-sharing, the ability to support others, and ensures that the school community knows what's happening and have opportunities and outlets to share their capacity, creative insights and expertise (Higgins et al., 2012; Lohrmann et al., 2008; McLoughlin et al., 2020).

'Engaging interest and investment' in an approach can help to ensure that the school community understands the relevance of an approach and the reasoning behind changes in working styles or approaches (Beidas and Kendall, 2010; Blaine et al., 2017; Kennedy et al., 2021). This can sustain interest over time, open receptivity to professional development and the learning of new skills, and help to garner commitment and support (Evans et al., 2015; Moore et al., 2021; Zhang et al., 2023). To sustain interest over time, the processing of engaging may need to be revisited with ongoing reminders and support provided to implementers (Freeman et al., 2014; Lohrman et al., 2008; Van Geel et al., 2017; Walker et al., 2022). What distinguishes this from uniting understanding about an intervention are attempts to change attitudes towards an intervention and implementation (Atkins et al., 2008; Drmic et al., 2017). This attitude change can involve personal and collective appeals in relation to the benefit of an approach (Cane and Oland, 2015; Gu et al., 2020). Motivation is relevant here using incentives or support to encourage implementers.

How does the evidence indicate outcomes?

'Engaging voices' is linked to outcomes including buy-in, readiness, and implementer wellbeing (Grossi et al, 2019; Guhn et al, 2009). Ensuring that pathways for communication are established and that adequate time is set aside to use these pathways helps to generate the opportunities for members of the implementation team, pupils, and wider community to have their say in the way that the school is addressing needs. Establishing and maintaining effective communication pathways to engage a range of voices in a meaningful way that works for the school setting is important over time, and is linked to sustainability of an approach (Massey et al., 2021). There is also evidence that student involvement is associated with fidelity (McLoughlin et al., 2022). This seems to be related to student buy-in, which, in turn, can impact staff buy-in and ease of delivering the intervention.

To create positive student perceptions and acceptance of interventions, evidence shows how students can lead in defining and recognising the priority and play a meaningful role in planning for the new intervention (Bonell et al., 2015; Frigge et al., 2019; Hudson et al., 2020; Sadjadi et al., 2021). When students' preferences for improvement are not heard or acted upon, students may not support new interventions and there can be resistance to change (Anselma et al., 2020; Giraldo-García et al., 2020; Kodish et al., 2020; Ronto et al., 2020). When the intervention seeks to improve pupil outcomes, relationships between pupils and those delivering the intervention are key and pupils need to perceive that they are listened to and treated with respect (Gaias et al., 2021; Giraldo-García et al., 2020; Sadjadi et al., 2021). Involving students and families can lead to buy-in and adoption of a new intervention (Gregory et al., 2021; Sadjadi et al., 2021). This tends to drive outcomes, including fidelity, when the involvement is more than consultation, for instance,

having pupil and family representation on teams and providing opportunities for pupils and families to advocate for the priority the school seeks to address (Frigge et al., 2009; Leeman et al., 2018; McLoughlin et al., 2022).

Engaging in co-operative and collaborative processes such as setting up implementation teams and seeking feedback at both inner and outer school levels is linked to the development of buy-in, adoption, and sustainability (Bingham et al., 2018; Pearson et al., 2015). It is thought to increase buy-in and adoption by ensuring that the wider school community feel included in the decision-making which affects them and that their perspectives are included (An et al., 2021; Guhn, 2009). Similarly, when the development of instruments or processes to monitor implementation are undertaken collectively, this can increase the likelihood of data systems and structures being more accessible, meaningful, and responsive to the realities of daily classroom practice for implementers (Goldenthal et al., 2021; Metz et al., 2021; Schildkamp et al., 2019; van Geel et al., 2017). When the collaboration amongst implementation teams can represent a wide range of perspectives this is evidenced to impact buy-in and sustainability of interventions (Chambers et al., 2020; Higgins et al., 2012).

Evidence indicates that interest and investment in an approach provides a deeper level of engagement than if these elements were not already in place or included in implementation approaches (Gale et al., 2020; Gagnier and Fisher, 2020; McLoughlin et al., 2021). Evidence suggests that school leaders can act as facilitators of active participation, engaging staff, pupils, and families with implementation processes including generating buy-in and exploring motivation and needs (Goldenthal et al., 2021). Constructing a dialogue between inner and outer school community members can take various shapes, for example, it is well established that cultivating dialogue between teachers and families during the preparing stages of implementation can help to build understanding through clear communication and transparency, which influences buy-in, readiness, and feasibility (Evans et al., 2015; Pearson et al., 2015). There is some evidence that engaging interest and increasing buy-in can also impact fidelity and intervention outcomes (Cook et al., 2015; McLoughlin et al., 2022; Monzalve and Horner, 2021; Van Geel et al., 2017). However, this can depend on whether the actions taken do appeal to recipients and improve their views.

Where people are resistant to change, implementation leaders can demonstrate the anticipated beneficial outcomes of a proposed change compared to previous practice (Gu et al., 2020). Opinion leaders who may be other staff or implementation leaders can help give the intervention 'prestige' and approval (Corboy, 2007; Cane and Oland, 2015; Guhn et al., 2009; Hudson et al., 2020). This has potential to improve acceptability and adoption (Atkins et al., 2008; Drmic et al., 2017; Dyssegaard et al., 2017). Also, leaders can recognise and conduct personal appeals and introduce incentives and provide staff with opportunity for skill and leadership development, assistance, and coaching to help achieve acceptability, adoption, and sustainability (Evans et al., 2015; Hollingshead, 2009; Williams et al., 2021). We found less evidence for more directive and top-down attempts at engaging implementers, with little evidence for mandating change and mixed evidence around financial incentives. Instead, we found evidence of school leaders modelling implementation practice through developing knowledge of a new approach and evaluating its fit with the school (Simmons and Martin, 2009) and generating engagement in others through demonstrating their own buy-in to the approach (Leung et al., 2020).

How does engaging as a mechanism link to strategies?

Engaging is explicitly referred to across many established implementation strategies (Cook et al., 2019) often falling under 'engage consumers' (p. 927). Some areas of engagement refer strongly to specific strategies which aim to communicate information and receive feedback such as assess for readiness (Gorard et al., 2020; McLoughlin et al., 2021; Arnold et al., 2021) or identify barriers and facilitators (and audit and provide feedback, which fall under evaluative and iterative strategies (p. 919). The strategy to involve students, family members, and other staff indicates that engaging or including these stakeholders who may not be involved in delivering interventions is the goal. Examples of meaningful involvement show pupils both adapting an intervention for their school context and communicating information in support of the intervention to peers (Frigge et al., 2019). This shows how meaningful involvement may include both engaging voices and engaging the interest of others. In relation to improving implementers' buy-in, engaging voices is important to understand the nature of buy-in in relation to the intervention (An et al., 2021; Grossi et al., 2019) to then address any shortfalls.

Similarly, engaging is well-represented in areas such as 'support educators', which captures the range of support-oriented strategies which schools can select from, for example, create practice teams (Higgins et al., 2012; McIsaac et al., 2015; Morrison et al., 2019) reminding school personnel of key aims, time frames and core components, as well as the range of strategies which schools engage to collect and make sense of data (Schildkamp et al., 2019; Albers et al., 2021; Metz et al., 2021). While data that has been collected implies reflecting will take place, several strategies are more focused on data collection and its reach. Therefore, engaging a range of voices is important in assessing readiness and identifying barriers and facilitators (Beidas, 2012). Engaging interest in an intervention is also indicated in the professional development strategy 'make training dynamic' (Gregory et al., 2021; Kennedy et al., 2021; Moore et al., 2021).

The use of champions to both support the intervention and support other staff by addressing any concerns is an example of a strategy that engages colleagues in relation to the benefits of an intervention, engaging interest and investment in

an intervention (Crane et al., 2021; Van Geel et al., 2017; Walker et al., 2022). More directly, although there is mixed evidence about their use, incentives can positively impact behaviour and buy-in related to an intervention (Austin et al., 2011; Hollingshead, 2009; Jago et al., 2015; Williams et al., 2021).

Summary

Engaging is the final mechanism in the refined programme theory, evidenced in our realist review by 64 papers and rated as a review finding with moderate confidence. While there tended to be more evidence about mental health interventions and qualitative research compared to reviews informing this mechanism, we do not have concerns about the relevance and rigour of this evidence. Rather we found surprisingly little evidence for aspects of engaging school staff that are more directed. A range of different actors can be engaged in implementation in different ways. This can involve engaging voices so that feedback and concerns can be shared from a range of relevant stakeholders. Engaging as a mechanism also includes how collaboration can underpin implementation action including amongst different teams and peers. Finally, engaging relevant actors can involve varying ways of increasing interest and motivation in relation to both implementation as a process and the new approach.

Engaging in these ways can impact a range of implementation outcomes including buy-in, feasibility, adoption, fidelity, and sustainability. Compared to other mechanisms there is less evidence of direct impact on fidelity and pupil outcomes, although there is some evidence that implementation strategies like reminders, using champions, and directly seeking to improve buy-in can impact both fidelity and intervention outcomes. Other implementation strategies that imply the value of engaging a range of actors in implementation include efforts to involve and engage stakeholders throughout implementation processes. It is also related to strategies that seek to support school staff, including the use of champions and providing incentives. We found little evidence for implementation strategies that might imply engaging interest such as increasing demand for new practices, disincentives, developing policy around a new practice, or mandating change.

Implementation strategy and ICAMO analysis

The refined programme theory holds explanatory power in relation to implementation in schools at a broad level, specifying key contexts that may be conditions for implementation and mechanisms that underlie a range of implementation actions. Therefore, we used additional review work to show more specific application of the refined programme theory and to answer our research question about the impact of implementation strategies that attempt to improve implementation of evidence-informed practice in schools. Through this additional review work we specify context-mechanism-outcome configurations relevant to both our refined programme theory and specific implementation strategies. This analysis allowed for further testing and potential refinement of the programme theory, exploring whether the contexts and mechanisms can relate to implementation strategies.

We selected Cook et al.'s Strategies, Translating ERIC Resources (SISTER) project as a basis for this further analysis. This taxonomy of 75 implementation strategies applies the Expert Recommendations for Implementing Change (ERIC) project (Powell et al 2012) to school contexts. Cook et al. (2019) assessed the relevance of the ERIC strategies to iteratively produce the taxonomy. Their SISTER project involved a seven-step adaptation process of review and revision by a panel of experts in implementation and school-based mental health. This resulted in 75 unique implementation strategies, the SISTER taxonomy, from which to choose and tailor strategies to school context-specific barriers and facilitators. Cook et al. made changes to wording or terminology (surface level) to 52 ERIC strategies, made adaptations that changed the core meaning to five ERIC strategies, deleted five ERIC strategies due primarily to contextual inappropriateness, and added seven new strategies. Lyon et al. (2019) evaluated the feasibility and importance of the SISTER strategies by surveying 200 school-based consultants who support the implementation of social, emotional, and mental health services. The importance and feasibility dimensions of each SISTER strategy were calculated from the survey summary statistics. The SISTER taxonomy was selected as it is the most comprehensive set of implementation strategies related to school settings we located in our review. While the initial selection and rewording of strategies was focused on implementation of school-based mental health interventions, the wording and definition of strategies are broad and drawn from a previous set of implementation strategies (ERIC) that has been applied in a range of community settings including schools (Balis et al., 2022; Komesidou and Hogan, 2023; Ward et al. 2021). As well as exploring the relationship between our refined programme theory and the SISTER strategies, this analysis also considers how broader educational research evidences the impact and use of the strategies.

We reviewed the full text of papers that we had already located (therefore from across the implementation of teaching and learning, behaviour, physical health and mental health interventions in schools) and citations from the two key papers cited above to identify relevant literature that evidenced the impact or helps understand the use of the SISTER strategies. We initially mapped the evidence we had located onto all 75 strategies and then reduced the number we focused on by excluding those with limited evidence or that overlapped with other included strategies. This process led to a focus on 34 strategies which had some evidence for their impact in reviews or empirical literature.

Alongside our consideration of literature focused on the strategies, we also identified where our realist review and refined programme theory related to the strategies. Typically, as part of a programme theory or set of programme theories, realist reviewers would evidence context-mechanism-outcome configurations. Because we were interested in evidencing these constructs in relation to implementation strategies and considering who the strategy might involve or impact, we drew upon Mukumbang et al.'s (2018) ICAMO configuration (intervention – context – actor – mechanism – outcome). These realist theoretical propositions relate to aspects of interventions and actors' interactions with them. ICAMO configurations allow for more specific, practical examples of a programme theory. By replacing intervention with implementation strategy, which after all is the condition we are interested in evidencing and explaining, we considered how well our refined programme theory fitted the range of implementation strategies. We made some minor changes to what was in scope for our mechanisms and labelled the intervention features context more clearly as part of refining the programme theory in relation to what we learnt. For instance, we found that we needed to explain raising interest and knowledge mechanisms in relation to some strategies and therefore broadened engaging and uniting to incorporate these aspects.

The following synthesis presents the implementation strategies we located evidence for and then presents a structured overview of the evidence for each strategy. The synthesis for each strategy includes evidence about how the strategy may impact implementation and intervention outcomes, the situations in which schools might use the strategy, how schools can use the strategy and any factors that enhance or hinder the use of the implementation strategy. After considering evidence in relation to the strategy specifically, we consider how the refined programme theory relates to the strategy and then present the best evidenced ICAMO configuration to show how the programme theory can evidence the action associated with each implementation strategy. We summarise the quality of evidence in relation to each strategy and confidence level for each ICAMO configuration using CERQual confidence ratings.

SISTER strategy analysis

Table 20 below details the strategies that were analysed. It gives the SISTER description of the strategy and indicates the implementation phase when the strategy is most likely to be initially used. Many strategies are used over time or outputs are referred to in later phases of implementation. However, we arrange the strategies analysed according to how early they are likely to be used starting with 'explore' strategies first. We drew upon our analysis and work by Moore et al. (2021) and Gunderson et al. (2021) who have assessed the use of SISTER strategies in implementation research and indicated the phases of implementation in which key strategies have been used.

The table indicates the implementation and intervention outcomes that have been evidenced as being impacted by research evidence relating to the strategy. It also indicates the contexts and mechanisms from the realist refined programme theory that are evidenced as applying to the strategy and leading to these outcomes. See Appendix 19 for a table showing the SISTER strategies that have not been analysed and rationale for this decision. Typically, strategies we have not analysed were either lacking in research evidence we had located in our review or were closely associated with a strategy that we have analysed and therefore we indicate this overlap, rather than reproduce similar analysis. Where separate strategies work together (e.g. developing and distributing resources) or rely on the same context and underlying mechanism (e.g. *ongoing* training or coaching), the strategies are analysed together.

Table 20: *SISTER strategy analysis—details of strategies analysed*

Strategy	SISTER description	Initial Phase	Context	Mechanism	Outcome
4. Conduct local needs assessment	Collect and analyse data related to the need for new practices.	Explore	Enabling Structures	Reflecting	Feasibility Appropriateness Sustainability
1. Assess for readiness and identify barriers and facilitators	Assess various aspects of the school context to determine the degree to which it and the school personnel within it are ready to implement, barriers that may impede implementation, and strengths or facilitators (such as, coaches, professional learning communities, whole staff training) that can be used/leveraged in the implementation effort.	Explore Preparation	Enabling Structures	Engaging	Acceptability Adoption Feasibility Buy-in Pupil outcomes
23. Conduct local consensus discussions	Include local teachers, staff, and other stakeholders in discussions that address whether the identified problem/need is important and whether the new practices to address the identified problem are appropriate.	Explore Preparation	Agents for Change	Uniting	Feasibility Acceptability Buy-in Sustainability
5. Develop a detailed implementation plan or blueprint	Develop a detailed implementation plan or blueprint that includes the intended goals/outcomes to be achieved via the implementation effort as well the process and strategies that will be used to achieve those goals. The blueprint should include: (1) aim/purpose of the implementation; (2) scope of the change (e.g., who and what settings will be affected); (3) goals/outcomes to be achieved; (4) timeframe and milestones; (5) appropriate performance/progress measures; and (6) specific strategies that will be used to attain goals/outcomes. Use and update the plan to guide the implementation effort over time.	Preparation	Intervention features	Uniting	Buy-in Adoption Sustaining Fidelity Pupil outcomes
22. Capture and share local knowledge	Capture local knowledge from other school sites on how school personnel were able to implement the new practice effectively in their setting and then share it with other sites.	Preparation	Agents for Change	Uniting	Adoption Buy-in Fidelity
57. Involve students, family members, and other staff	Engage or include students, families, and other staff in the implementation effort who may not directly be involved in delivering the new practice but are associated with it.	Preparation	Enabling Structure	Engaging and Uniting	Acceptability Buy-in Fidelity
60. Access new funding	Access new or existing money to facilitate the implementation.	Preparation	Enabling Structures	Uniting	Adoption Cost Fidelity Sustainability
18. Test-drive and select practices	Support school personnel to try out various practices in small doses and have them choose/select the one they find most acceptable and appropriate.	Preparation	Agents for Change Enabling Structures	Uniting	Fidelity Penetration Sustainability
68. Change/alter environment	Evaluate current environment and, as needed, alter or change aspects of it (e.g., changing the layout of a classroom, master scheduling, repurposing space) to best accommodate new practices.	Preparation	Intervention features	Reflecting	Adoption Buy-in Fidelity Sustaining

74. Pruning competing initiatives	Taking away or reducing other implementation efforts to reduce implementation overload and enable school personnel to focus their energy and effort on delivering an identified programme or practice.	Preparation	Intervention features	Uniting	Adoption Buy-in Sustaining
26. Identify and prepare champions	Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in a school or district.	Preparation	Agents for Change	Engaging	Adoption Feasibility Fidelity Pupil outcomes
28. Inform local opinion leaders	Inform school personnel identified by colleagues as opinion leaders or 'educationally influential' about the new practices who can socially influence colleagues to adopt it.	Preparation	Agents for Change	Uniting	Diffusion Adoption Sustainability
34. Recruit, designate, and train for leadership	Recruit, designate, and train leaders for the change effort so they can effectively engage in leadership behaviours that support others to adopt and deliver the new practice.	Preparation	Enabling Structure	Uniting	Adoption Acceptability Fidelity Sustainability
48. Create new practice teams	Change who serves on the team supporting the practice or implementation effort, adding different disciplines (counsellor, school psychologist, behaviour specialist, school-based mental health provider) and different skills to make it more likely that the new practices is delivered (or is more successfully delivered).	Preparation	Agents for Change	Engaging	Buy-in Sustainability
43. Make training dynamic	Vary the information delivery methods to cater to different learning styles, structures for professional development, and shape the training in new practices to be interactive.	Preparation	Agents for Change	Engaging	Acceptability Fidelity
38. Conduct educational outreach visits	Have a trained person (i.e., person who has developed the intervention, received certified training in the practice, and/or extensive experience implementing the practice) meet with school personnel in their practice settings to educate them about new practices with the intent of changing the school personnel's practice.	Preparation	Intervention features	Uniting	Acceptability Adoption Fidelity
45. Shadow other experts	Provide ways for key individuals to directly observe experienced people engage with or use new practices.	Preparation	Agents for Change	Reflecting	Buy-in Fidelity Acceptability Pupil outcomes
46. Use train-the-trainer strategies	Train designated school personnel to train others in new practices.	Preparation	Enabling Structure	Uniting	Fidelity Diffusion
41. Develop educational materials 42. Distribute educational materials	Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about new practices and for school personnel to learn how to deliver the new practices with fidelity. Distribute educational materials (including guidelines, manuals and toolkits) in person, by mail, and/or electronically.	Preparation	Intervention features	Uniting	Fidelity Adoption Buy-in
51. Improve implementers' buy-in	Engage school personnel in activities or discussions that attempt to increase their buy-in and motivation to adopt and use the new practice.	Preparation Deliver	Agents for Change	Engaging	Fidelity Sustainability Adoption Pupil outcomes

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6. Develop and organise quality monitoring system	Develop and organise systems and procedures that monitor implementation and/or student outcomes for the purpose of quality assurance and improvement.	Preparation Deliver	Enabling Structures	Uniting	Fidelity Penetration Sustainability Pupil outcomes
7. Develop instruments to monitor and evaluate core components of the innovation/new practice	Develop, validate, and integrate measurement instruments or tools to monitor and evaluate the extent to which school personnel are implementing the core components of the intervention (i.e., with fidelity).	Preparation Deliver	Intervention features	Reflecting	Fidelity Sustainability
39. Conduct ongoing training 44. Provide ongoing consultation/coaching	Plan for and conduct training in new practices in an ongoing way. Provide ongoing consultation/coaching with one or more experts in the strategies used to support implementing new practices.	Preparation Deliver	Enabling Structures	Reflecting	Fidelity Sustainability Pupil outcomes
14. Provide practice-specific supervision 30. Model and simulate change	Provide school personnel with supervision focusing on new practices. Supervisors are in a position of authority and support school personnel who deliver new practices with evaluative feedback via performance assessment. Supervision is typically differentiated from consultation/coaching, which may be provided by an internal or external individual who may or may not have authority over the implementer. Model or simulate the change that will be implemented prior to implementation.	Preparation Deliver	Agents for Change	Uniting	Fidelity Buy-in
17. Tailor strategies	Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection.	Preparation Deliver	Agents for Change	Reflecting	Feasibility Acceptability Fidelity Sustainability
16. Promote adaptability	Identify the ways a new practice can be tailored or adapted to best fit with the school/classroom context, meet local needs, and clarify which elements of the new practice must be maintained to preserve fidelity.	Preparation Deliver	Intervention features	Uniting	Feasibility Acceptability Fidelity Sustainability Pupil outcomes
53. Remind school personnel	Develop reminder systems (e.g., email prompts or visual cues) designed to help school personnel recall information and/or prompt them to deliver core components of new practices.	Preparation Deliver	Enabling Structures	Reflecting	Fidelity Sustainability
54. Targeting/improving implementer well-being	Supporting school personnel to reduce stress and burnout in order to promote their well-being and behavioural intentions to implement new practices.	Preparation Deliver	Enabling Structures	Engaging	Adoption Fidelity Sustainability Pupil outcomes
61. Alter and provide individual- and system-level incentives	Work to provide individual- (e.g., recognition and acknowledge, gift card) and/or system-level incentives to districts or schools to participate (e.g., grant money, free training, and consultative support) and engage in an implementation effort involving a new practice.	Prepare Deliver	Enabling Structures	Engaging	Adoption Buy-in

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Evidence review

8. Obtain and use student and family feedback	Develop strategies to increase student and family feedback on the implementation effort.	Deliver	Enabling Structures	Engaging	Readiness Acceptability Sustainability
12. Facilitation/problem-solving	A process of interactive problem-solving and support that occurs in a context of a recognized need for improvement in the implementation of a specific practice and a non-evaluative but informative and supportive interpersonal relationship.	Deliver	Agents for Change	Uniting	Buy-in Fidelity Staff wellbeing Sustainability Pupil outcomes
50. Facilitate relay of intervention fidelity and student data to school personnel	Provide as close to real-time data as possible about key measures of intervention fidelity and student outcomes using integrated modes/channels of communication (e.g., email, social media, face-to-face notes) in a way that promotes use of the targeted new practices.	Deliver	Enabling Structures	Reflecting	Fidelity Sustainability Pupil outcomes
32. Organise school personnel implementation team meetings	Develop and support teams of school personnel who are implementing new practices and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning.	Deliver	Enabling Structures	Reflecting	Fidelity Sustainability
10. Stage implementation scale-up	Phase implementation efforts by starting with small pilots or demonstration projects and gradually moving to a system wide rollout.	Deliver Sustain	Intervention features	Reflecting	Penetration Sustainability

Each analysed strategy is presented in turn using a similar structure in the remainder of this chapter. We provide the definition of the strategy given by Cook et al. (2019) and any other relevant definitions located in the reviewed literature. We review the extent to which evidence indicates that using the strategy leads to outcomes (implementation and pupil outcomes). We consider evidence about the situations school might use the strategy, how the strategy can be used well, and factors that might enhance or hinder the strategy. We then describe where any of the contexts and mechanisms from our refined programme theory are relevant to the strategy. We then present an ICAMO configuration that evidences how the programme theory can explain how the strategy can lead to improved outcomes. Typically, we focus on one context and mechanism in this configuration indicated to be most relevant to the strategy and well connected according to the evidence reviewed. A confidence rating is provided for each ICAMO configuration to indicate how well evidenced they are.

4. Conducting local needs assessment

Strategy 4 of the SISTER compilation is 'conducting local needs assessments'. It is classified by Cook et al. (2019) as an evaluative and iterative strategy and although it is indicated to happen in early phases of implementation to inform the selection of an intervention, it can happen across implementation phases.

Definitions in the literature

Schools may conduct local needs assessments by collecting and analysing data related to the need for new practices (Cook et al., 2019). Needs assessments are often undertaken during the earliest stages of implementation, when needs and priorities are being explored to establish the need for change and to identify which types of intervention might address the priority effectively. However, needs assessments are also commonly undertaken once an approach has been selected and those done later help schools to identify what support or resources are necessary for successful implementation (March et al., 2020).

To what extent does the evidence indicate outcomes?

Selecting an intervention based on whether it meets the needs of pupils, e.g., improving educational attainment, and whether it is supported by evidence is recommended across evidence (Fixsen et al, 2005; Dyssegaard et al, 2017; Albers et al, 2021). However, we were not able to locate that much literature that explains how needs assessments may take place or the impact of conducting them. There is more evidence for features of needs assessments than examples of a holistic data capture to assess priorities for a school. Evidence ranges from reviews to qualitative research. Not all the research indicates the benefits of needs assessments (e.g. Malloy et al., 2015).

Conducting needs assessments plays an instrumental role for schools that are preparing to implement a new approach (Gabby et al., 2017). Needs assessments help to pinpoint where there are specific needs across the school context. They can address a priority area, and the data produced during the assessment process helps select the intervention that best fits the school context (Albers and Pattuwege, 2017; Dyssegaard et al., 2017; Albers et al., 2022). Needs assessments add value by helping implementation stakeholders to develop a data-informed overview of the individual, social, cultural, and environmental factors that may influence practice (Roach et al., 2009; Alonge et al., 2020). In relation to the school context and the specific improvement need, needs assessments can help stakeholders in several other ways. They can help stakeholders to be involved in the process of identifying the determinants of implementation, in defining the ways in which factors interact to reinforce or undermine the objectives of implementation (van Geel et al., 2016) and can help stakeholders to better understand what specific support colleagues would find useful to help them to prepare for implementation and to deliver an intervention in the way that was intended (Fixsen et al., 2005; Hudson et al., 2020).

Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional and behavioural needs. They found a large beneficial effect on fidelity for the six studies that reported review student data as a technique. While this review of student data might occur outside of needs assessment, it does indicate that such review to understand needs can be beneficial.

In contrast, Malloy et al. (2015) evidence a negative effect of being involved in decision-making after needs are assessed. They evaluated the influence of teachers' ratings of school climate on fidelity of Positive Action, a socio-emotional and character development programme in 18 elementary and middle schools. They explored the extent to which participatory decision-making was associated with fidelity. Participatory decision-making referred to the extent to which teachers shared in decision-making that impacts the school. Therefore, it is part of how needs assessments are described. However, they found a negative association between teacher ratings of the extent to which their school uses participatory decision-making and self-rated fidelity of the programme. The authors suggest that perhaps participatory decision-making might lead teachers to tailor whether and how much to implement a programme, so lowering fidelity.

Another study supported the impact of assessing needs of teachers who were receiving a coaching intervention informed by the assessment. Johnson et al. (2018) assessed how coaching activities including teacher needs assessment related to implementation dosage and fidelity of the 'good behaviour game' intervention across 138 teachers receiving coaching.

Needs assessment predicted working relationship with the coach and there was some beneficial, yet not statistically significant, evidence that needs assessments predicted fidelity. Pas et al. (2015) conducted a similar study, although this time an RCT considering when coaching was for the good behaviour game alone or with a social emotional learning curriculum too. Needs assessments informed the intensity of coaching. However, this study was not able to isolate the impact of this needs assessment.

Freeman et al. (2014) found in a study interviewing implementation team participants about factors that facilitated implementation of a whole school conflict resolution programme that identification of local needs acted as a motivator to engage with an intervention that can respond to those needs. Being able to adapt the curriculum to specific needs was also recognised as a facilitator in this study. This indicates that the intervention that may be selected after a local needs assessment needs to be modifiable in response to the needs. This is similarly supported by Trapani and Annunziato's case study (2018) which evaluated the efficacy of the Understanding by Design instructional framework implementation plan, utilised within some U.S. school contexts. The study noted that if schools accept the premise that change is a process not an event, then school administration, including leadership teams are effectively tasked with providing what staff need to effectively cross the implementation bridge (a concept coined by Hall and Hord (2006) to conceptualise the process of accepting and committing to a new approach). The implication is that without purposeful inquiry into needs, school leaders may be disempowered as to how best to proceed with decision-making, including around the most effective use of finite resources to address the needs of staff and wider school community, leading to poorer implementation outcomes.

Desimone's evidence review (2002) found that implementers reported that an influential factor in the adoption of schoolwide programmes was allowing sufficient time for curriculum development and collaboration between teachers involved in implementation. Similarly, the review found that schools where more planning time was allocated were reported as having higher levels of implementation, which was more efficiently and effectively resourced, than schools where less planning time was allocated. This implies that time is a key need for staff when implementing and through identifying a need and addressing it, schools can improve implementation outcomes including feasibility and adherence.

In summary, two reviews, three quantitative studies, one mixed-methods study, and one qualitative study demonstrate some beneficial impact of local needs assessments on outcomes that include fidelity and adoption. However, there was mixed evidence on the impact on fidelity, with participatory decision-making perhaps encouraging implementers to adapt interventions, thus lowering fidelity. The evidence reviewed suggests beneficial outcomes when needs assessments are used to select an approach to address needs and identify the kind of support that implementers will need to deliver the approach.

What does the evidence tell us about the situations in which schools might use this strategy?

There is more evidence, including from reviews, that points to the potential benefits of conducting needs assessments and when schools might do this. Current evidence recognises the value and role of conducting needs assessments, particularly during the early, exploratory stages of implementation, such as in the lead-up to selecting an approach, or in the preparation stages, when initial professional development and support are made available to staff.

Silva et al.'s (2021) evidence review unpacked the challenges and constraints encountered by preservice and novice teachers when implementing student-centred models. Their synthesis found three primary challenges to the successful implementation of student-centred models amongst these populations: '(a) teacher-related challenges (i.e., pervasive beliefs, occupational socialization, managerial- and instruction-related); (b) student related challenges (i.e., student resistance to engaged participation in student-centred models); and (c) external challenges (i.e., context- and environment-related)' (p. 798). These challenges imply that examining and understanding the range of needs of those involved in implementation may be a gateway to establishing better decision-making and longer-term viability of the approach. For example, understanding how student resistance plays a role in embedding an approach may help implementation leaders to facilitate more specific training for implementers around how to engage students productively to overcome resistance. Undertaking needs assessments may also provide insights into the occupational socialisation influencing teachers which may require addressing to generate buy-in and increased implementer wellbeing.

Evidence indicates that conducting needs assessments are valuable beyond initial stages of exploring and selecting a suitable approach and preparing to implement it. Chambers et al. (2013) go as far as to state that needs assessments must be undertaken iteratively to foster the chances of greater sustainability. Needs assessments may be central to the long term viability of an approach because through 'concentrating on the dynamic "fit" between an intervention and its delivery context as the core ingredient underlying sustainability' implementers 'can embrace opportunities to refine and improve the intervention' (p.7). Chambers et al.'s 'dynamic sustainability framework' further suggests that embracing change as a central influence on sustainability is paramount if organisations are to undertake continual needs assessments inquiries and use the data to inform practice decisions. Lessons learnt from needs assessments form according to Chambers et al., a pivotal piece of the implementation puzzle which can help to 'improve intervention design, testing, and ongoing system change (p. 7).

Assessing needs in relation to a specific area of improvement can help to gain insights into current degrees of capacity, capabilities, and motivation among staff involved in implementing an approach to address the area that needs

improvement (Trapani and Annunziato, 2018). This knowledge can inform decision-making around the various elements which feed into activity selection and subsequent preparation, including regarding the types and duration of professional development that is required and targets (Ryan Jackson et al., 2018; Straw et al., 2020).

Needs assessments can also help to recognise and show the functioning of existing teams and the levels of collaboration which are likely to influence implementation. They may indicate where isolation may be occurring in teams and where social intervention, such as the development of coaching, mentoring or specific communication feedback pathways for staff, may help to foster a more supportive and social environment for stakeholders involved in implementation (Goldenthal et al., 2021).

In relation to environmental determinants, needs assessments can help to establish a need for change at the earliest stages of implementation and later on can help to establish what strategic alterations or adaptations need to be made to reinforce and support the implementation of a specific intervention (Alonge et al., 2020). In a study which examined the rollout of the free school meals programme in Scottish schools, researchers found that when implementation teams developed tools to assess the school environment, using indicators such as whereabouts in the school relationships to food were formed and how the environment encouraged healthy attitudes toward food, this enabled implementers to contextualise and make sense of the ways in which the school environment helped or hindered the objectives of implementation for pupils, such as increased access to and consumption of nutritious food (Chambers et al., 2020). For example, during the implementation phases, the data captured indicated that staff perceived environmental changes as dependent on the availability of funding and on senior leadership support. However, staff expressed concern about the reliability of such support over time, and this threatened to undermine progress and reduce belief in the longer-term viability of the approach.

Needs assessments help to develop a more accurate picture of people's skills, confidence and capacities, and our analysis highlighted that needs evolve over time (Roach et al., 2009). Therefore, it may be valuable to view needs assessments as a useful engagement tool that can be applied thoughtfully and pragmatically at any stage of implementation rather than seeing them purely as an endeavour that takes place early in the implementation process. Revisiting needs assessments at later stages of implementation can play a pivotal role in making informed decisions by drawing on the latest information, by situating this information in the light of contextual influences and by not assuming previously identified needs have been resolved, remain, or have undergone predictable changes (Koh and Askell-Williams, 2021).

What does the evidence tell us about how the strategy works well?

Evidence indicates that needs assessments work well in real time across implementation phases and when they actively inform decision-making by leadership. A longitudinal qualitative study of staff across five U.K. secondary schools implementing a universal mindfulness approach found that knowledge of staff needs was linked to high levels of implementation (Hudson et al., 2020). Applying findings to the Consolidated Framework for Implementation Research (Damschroder et al, 2009; 2022) researchers found that school leadership, including the ways in which leadership involved and engaged staff in decision-making processes, was strongly associated with acceptability, buy-in, and sustainability of implementation. Relative priority of staff involved was also rated highly correlated with high levels of implementation and linked to assessing the needs of staff and how they would prefer to have their needs met.

Lyon et al. (2021) indicates how needs assessments work with other strategies to prepare for implementation. They discuss how human-centred design can align intervention development with the needs to users of youth mental health services. Steps one to three of the human-centred design (HCD) process seem particularly relevant to local needs assessment: (1) identify need and plan the HCD process, (2) understand and specify context of use, and (3) specify users and user/context requirements. However, these steps are iterative and should go hand in hand with planning.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Needs assessments appear to be more impactful when they are acknowledged and have engagement from a range of stakeholders. As Guhn et al. (2009) explain in a review of factors that help sustain school reform interventions, successful implementation in schools shares some universal principles such as 'relationship-building, competence training, sense of ownership and autonomy' (p. 257). At the same time, 'implementing such universal, evidence-based processes might, via adaptations according to the need assessment, result in individually and culturally different practices' (p. 257–258) therefore the need for leadership to be receptive to changing practices dependent on the emergent needs of staff is key both when selecting an intervention and as needs may change over time (Gabby et al, 2017; Trapani and Annunziato, 2018; Leung et al, 2020).

Chambers et al. (2020) suggest that needs assessments can be complicated and can impact outcomes in direct and indirect ways. The needs assessments carried out in the schools involved in the study often occurred in fragmented ways, and conversations around the needs of education and catering staff often took place separately. However, despite this fragmentation, the conversations that did occur helped those involved to address a key goal of implementation, which was to foster a positive lunch hall environment. This was subsequently achieved by 'school senior leaders being present in the dining hall, providing practical support to children, identifying pressure points, asking P1–3 teachers to

supervise, and implementing a buddy system with older children supporting younger ones' (2020, p. 5). The presence of shared goals and the occurrence of some form of needs assessment helped to direct conversations towards meaningful action in relation to implementing a specific intervention resulting in acceptability and buy-in. This is echoed in recent systematic reviews of evidence concerning what works in school implementation, which found that 'bottom-up activities facilitated by listening to teachers' needs and wishes and use of collaborative inquiry' were important features that commonly appeared across evidence and were linked to positive stakeholder attitudes and perceptions around implementation (Dyssegaard et al., 2017, p. 16).

Needs assessments are useful strategies to identify barriers and indicate the impact of not addressing these. In a study which examined the implementation of digital technology in secondary school chemistry classrooms in the U.S. context, time-management concerns were found to increase the likelihood of superficial engagement with implementation, which led to lower degrees of important implementation outcomes such as fidelity (Gabby et al., 2017). Assessing degrees of capacity, both perceived and actual, can also help to structure inquiries around workload expectations and how implementation can focus on necessary rather than burdensome tasks (Fixsen et al., 2005).

What does our realist review show are relevant contexts and mechanisms?

While all constructs hold relevance to needs assessments, the first distinction suggested by our analysis is that there needs to be a range of *enabling structures* to support staff to capture and disseminate data regularly and systematically through reflective processes. *Enabling structures* such as regularly dedicating time to data-capturing can provide implementation stakeholders with the opportunity to cultivate active inquiry into perspectives on, experiences of and beliefs about implementation which draws on a range of data and collective processes. Enabling structures can also provide ongoing engagement with data through increasing the opportunity for stakeholder communication. This can help to link needs with contextual factors as well as indicate how needs develop and evolve over time (Trapani and Annunziato, 2018). The second distinction relates to staff having the opportunity to *reflect* on the starting points and outcomes of implementation. The evidence suggests that when staff can explore why particular needs have emerged and what factors, either positive or negative, have contributed to these needs emerging, they are able to understand better the links between contexts, behaviours, and outcomes and how the intervention will specifically address needs that have arisen (Hudson et al., 2020). This can be a useful way of tangibly breaking down the multilevel factors which may be influencing practice and outcomes (Maxwell et al., 2019). This process of linking previous outcomes with these factors can also be a helpful way of anticipating facilitators and barriers and highlighting current strengths and sources of support as well as pinch points which slow or inhibit progress (Hudson et al., 2020). Having dedicated time and space for reflecting can help implementation stakeholders to consider what needs assessments are suggesting in terms of capabilities, capacities and motivation across the school community. This can have a meaningful impact on a range of important decisions such as selecting the most suitable evidence-informed approach to address a primary need and exploring how the intervention will specifically address needs. Reflecting on the factors which are driving areas of need including who, where, how, and why can help to empower staff to unite understanding through sharing experiences, sense making, and through exploring learning and expectations (Durand et al., 2016).

Our realist synthesis indicated the interaction of enabling structures impacting feasibility and appropriateness outcomes in relation to the intervention selected, as indicated in the ICAMO configuration below.

ICAMO configuration

When thought is being given to how to undertake needs assessments, schools may wish to consider the programme theory context of 'enabling structures'. Our analysis suggests that effectively conducting needs assessments requires dedicated time and space for capturing data as well as for dissemination so that data can be made sense of in terms of interactions with multilevel determinants. Furthermore, structures which enable needs assessments to be revisited throughout later stages of implementation can support comparative analyses of how needs may have evolved over time. Senior leaders or those with decision-making authority over schedules and timetabling are best placed to ensure that structures for conducting needs assessments are present and effective. However, this role may also incorporate modelling the types of reflective processes that are valuable for making comparative assessments as well as facilitating discussions which generate connections and insights around how determinants may influence needs. Once dedicated time and space is made available, a range of needs can be identified through several types of data collection including questionnaires, observations, and discussions. During this phase, when leaders actively listen rather than assume knowledge about what might be helpful, new insights can be generated that help to make informed and responsive decisions about training and other resources. Although various stakeholders are engaged in the processes of doing needs assessments, it is the action of reflecting on those voices that may be the most productive process, particularly when it is done by exploring how needs change over time and what determinants of change may mean for future decision-making. It is this reflective aspect of conducting needs assessments which helps to engage deeper critical thinking that can translate to meaningful action. Understanding that needs assessments involve capturing and disseminating data in relation to contextual determinants of implementation can help implementation leaders to build up a greater configurative understanding of needs and how best to prioritise and address them. This can ensure the feasibility and appropriateness of the support and training that is provided. Furthermore, revisiting needs assessments

can guarantee that the emergence of new needs and the resolving of previous needs may be better acknowledged and understood, ensuring that resources are managed effectively and responsively and with precision.

Implementation Strategy 4: Conduct local needs assessments				
Collect and analyse data related to the need for new practices.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures (allocating designated time and space for conducting and disseminating local needs assessments across all phases of implementation)	Implementation leaders	Reflecting (listening, linking and making comparative analysis helps to establish why and how needs emerge, function and resolve)	Facilitates a greater depth of understanding about needs and how they change. In relation to the intervention this can impact Feasibility Appropriateness Sustainability	Roach, 2009; Durand et al., 2016; Trapani and Annunziato, 2018; Maxwell, 2019; Hudson et al., 2020; Koh and Askeil-Williams, 2021.
CERQual confidence rating: Low				

Summary

There is evidence that conducting local needs assessments is a beneficial strategy in isolation or in line with other related action. However, not all evidence shows the benefit of this strategy and the outcomes indicated, along with more distal ones will rely on further implementation strategies.

Our realist review synthesis shows how enabling structures allow for school stakeholders to engage with reflective inquiries which build on and disseminate information in ways that help to support implementation decision-making. Conducting local needs assessments is more than an early-stage endeavour in the implementation process. Enabling structures such as dedicated time and space are required so that implementation leaders can capture a range of data from different perspectives. Needs assessments also require dedicated time and space in which to disseminate data in terms of the individual, social, cultural, and environmental determinants that may be influencing needs across the school community. It is therefore important to understand how and why needs occur and at what level of the school system they might best be addressed. The different levels include, for example, an individual mentoring level, a group training level, a policy change level, and an environmental level or a combination of two or more of these multilevel elements. Structures which help to enable reflection on how needs change over time in response to multilevel factors can help to develop a greater depth of understanding regarding how behaviours and actions are influenced by time and other contextual determinants. Such structures can also assist in identifying how changes may inform subsequent outcomes. This reflection can help to empower and inform implementation stakeholders and assist them to acknowledge and address the emergence of needs that occurs within the complex and adaptive school environment. The ICAMO configuration is rated at a low level of confidence. This is because of concerns in relation to the adequacy of data showing the impact of this strategy on outcomes and the relevance of the evidence to the range of activity that might be considered in relation to a local needs assessment.

1. Assess for readiness and identify barriers and facilitators

Sister Strategy 1, ‘assess for readiness and identify barriers and facilitators’, is categorised by Cook et al. (2019) as an evaluative and iterative strategy which involves assessing ‘various aspects of the school context to determine the degree to which it and the school personnel within it are ready to implement, barriers that may impede implementation, and strengths or facilitators (such as, coaches, professional learning communities, whole staff training) that can be used/leveraged in the implementation effort’ (p. 919).

Definitions in the literature

Readiness is indicated as the degree to which various aspects of the school context and the school personnel within it are ready to implement a specific change or approach (Flaspohler et al, 2008). Assessing readiness and identifying facilitators and barriers has been defined broadly as efforts used to measure how prepared staff are and the school

environment is for implementation (Flaspohler et al, 2008). There is a distinction between the process of examining readiness through the identification of facilitators and barriers and 'perceived readiness', which is the output of acting on information associated with facilitators and barriers in ways which help to support implementation efforts. Assessing readiness is often indicated as a process in which implementers collect and interpret a range of data from various sources (including staff, pupils, families) to establish areas where support or changes need to occur. Savage et al. (2011) refer to this process as entering a partnership with the school community whereby rather than acting in a top-down manner, school leaders focus on actively questioning and listening to the school community to better understand the enablers and inhibitors to implementation and how these work.

Lohrmann et al. (2008) similarly argue that schools need to assess staff readiness, sharing information and evidence. Readiness can be influenced by presenting a rationale for a new intervention and connecting to existing skills and practice; however, this fits with SISTER strategy 51: Improve implementers' buy-in. Reflection plays a key role in these opportunities to gradually assess attitudes, beliefs, and understanding around the area of need and how these change over time. Related to readiness is assessing the acceptability and feasibility of an approach under consideration (Holt et al., 2022). However, the SISTER strategy specifies that the process of assessing for readiness should include three broad areas that are not necessarily focused on a selected intervention and therefore readiness can be considered in terms of implementation of new approaches more broadly and wider implementation climate of a school:

1. assess various aspects of the school context to determine the degree to which it and the school personnel within it are ready to implement;
2. barriers that may impede implementation; and
3. strengths or facilitators that can be used/leveraged in the implementation effort (Cook et al., 2019).

To what extent does the evidence indicate outcomes?

Our review of the evidence located several empirical studies of mixed quality that show the beneficial impact for schools of assessing for readiness including implementation outcomes of adoption, buy-in, acceptability, and feasibility as well as a range of pupil outcomes including resilience and increases in attainment. There was a lack of quantitative evidence located that shows the impact of assessing for readiness on outcomes.

Holt et al. (2022) conducted a year-long action research project within a single Early Years setting to explore how practitioners prepared to effectively deliver mindfulness approaches. They adapted the Research and Development in Organisations (RADIO) model which enables researchers to develop, adapt and reflect on their practice through cyclical working. The strength of this model, according to its application in research with schools, is the relevance of the domains to assessing aspects of readiness:

- awareness of need;
- invitation to act;
- clarifying organisational and cultural issues;
- identifying stakeholders;
- agreeing the focus of the concerns;
- negotiating the framework for data gathering;
- gathering information;
- processing information with research;
- agreeing areas for future action;
- action planning;
- implementation of action plans; and
- evaluating action plans.

Holt et al. (2022) evidence through research diaries and focus groups with staff that structuring readiness for implementation around the above domains helped to instil a gradual approach and presented staff with opportunities to collaborate and practice before incorporating the new practice into routines. This resulted in self-reported increases in staff wellbeing, greater perseverance, and increased shared learning around what implementation would entail.

McLoughlin et al. (2020) utilised a mixed method research design to examine the degrees of engagement and motivation across 30 school leaders for providing ancillary support for local school wellness programming. The study found that when training and support was designed around a sequential capacity-building process, where readiness is considered as a process of inquiry rather than a one-off event, this increased the feasibility of the approach among leaders and they were able to provide training to address needs as they emerged. The importance of a sequential capacity building process reflects the link between gradual and ongoing elements of readiness and the need for leaders to pay consistent attention to how perceptions of implementation are evolving to be able to address appropriate support strategies (Arnold, 2021; Koh and Askill-Williams, 2020).

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. Assessing for readiness, barriers, and facilitators was one of 37 implementation strategies used by stakeholders

including researchers. While these measures were used by the research team, it does evidence that staff can simply be asked what would help them to be ready for a new intervention and how anticipated barriers can be addressed. This may suggest that the assessment does not need to be particularly formal or detailed.

Similarly, Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Readiness was measured here using a survey. Survey results fed into efforts to tailor strategies between coaches and school staff. The researchers saw this data collection around readiness, barriers, and facilitators as occurring across the 'explore' and 'prepare' phases of implementation. Plans were created, updated, and recreated as often as necessary for each implementation team as part of an ongoing iterative process of assessing, planning, and implementing. This was supported by a coach, a trained expert in the interventions assigned to each school. Researchers concluded that reviewing plans was particularly important as this was mentioned as supporting implementation by 19 schools.

Flaspohler et al. (2012) report an evaluation of a support system designed to help elementary and middle schools implement whole-school prevention interventions. Part of this involved staff completing an online readiness assessment, the data from which fed into planning as part of the grant application to fund the intervention. The support system assisting implementation teams to have time necessary to collect and use data about success and challenges and to engage in shared problem-solving and thus consider readiness. Findings suggest the ongoing collection of information related to readiness assisted in the adoption and implementation of the intervention. This may have helped alongside other work by the implementation team to improve fidelity and sustain this intervention over five years.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services; participants considered assessing for readiness and identifying barriers and facilitators as both an important and feasible SISTER strategy. Similarly, Connors et al. (2022) asked school mental health practitioners and researchers to rate the importance and feasibility of implementation strategies to increase school mental health providers use of measurement-based care (collection and use of student data throughout treatment). Six strategies were rated as particularly important and feasible, this included 'assess for readiness and identify barriers and facilitators'.

In summary, two quantitative studies, two mixed-methods studies and two qualitative studies demonstrate beneficial impact of assessing for readiness and identifying barriers and facilitators on outcomes that include adoption, buy-in, acceptability and feasibility as well as pupil outcomes including resilience and increases in attainment. The evidence reviewed suggests beneficial outcomes when assessing for readiness and identifying barriers is a strategy that is utilised over time.

What does the evidence tell us about the situations in which schools might use this strategy?

Assessing readiness and identifying facilitators and barriers is a helpful strategy for schools to draw on in earlier phases of implementation because it can help to select an appropriate and feasible intervention based on the strength of evidence and coherence with the needs of staff, pupils, and wider school community (Hudson et al., 2020). In these initial stages, the identification of relevant facilitators and barriers can help to inform planning processes and make plans responsive to the needs of staff and community (Belansky et al, 2013; Zhang et al, 2021).

Ryan Jackson et al. (2018) suggest that even in rapid school improvement readiness and identifying facilitators and barriers is key. Whilst Ryan Jackson et al.'s domains do give weight to the earlier stages of implementation, they recognise the role of not just developing school implementation climate conducive to introducing a new intervention but also the importance of sustaining this over time. This also implies that readiness for change and the knowledge that comes from identifying facilitators and barriers as they emerge (Koh, 2021) is part of an ongoing iterative process throughout the implementation journey.

What does the evidence tell us about how the strategy works well?

Assessing for readiness can work well when approached in several ways. Evidence suggests that school leaders play a role in the ways in which readiness is perceived and approached in implementation. The enthusiasm and motivation of leaders to model reflection through facilitating shared learning opportunities have been shown to trigger other key mechanisms linked with identifying facilitators and barriers (Lyon et al. 2019; Moore et al. 2021). This is supported by other evidence which suggests that headteachers' beliefs around the subject of implementation as well as the process itself have been shown to impact the implementation of health-related interventions in the school context (Hudson et al., 2020). Considering these points from a research perspective, engaging school leaders in training and intervention design processes may also help to disseminate evidence effectively and ensure that misconceptions around the intervention are challenged appropriately. This may prepare the ground for school-based interventions, especially those designed by stakeholders external to schools, to anticipate and act on dimensions of school-level readiness.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Several empirical studies show that assessing for readiness can be enhanced by leaders providing the necessary time and space to gather and interpret a range of diverse types of data from staff, pupils, and wider community (Leung et al, 2020). Conversely, leaders who do not value or emphasise the importance of assessing for readiness, perhaps due to a perception that change needs to be implemented with speed, often underestimate the potential of assessing readiness as a powerful tool for fostering resilient and responsive implementation practices (Gorard et al., 2020).

Readiness may need to be assessed over time. For example, evidence suggests that implementation processes and practices should be aware and responsive to context and changing circumstances to meet the needs of the school community (Durand et al, 2016; Koh and Askell-Williams, 2021). This infers that assessing for readiness may work best when revisited regularly. Assessing for readiness is, however, also more than a tick box exercise and by its nature poses elements of unpredictability. For example, needs assessment during initial stages of implementation may reveal that staff require specific training to prepare to implement. This training may be undertaken but assessing for readiness may reveal other barriers to implementation.

This was the case in a small-scale study conducted in a secondary school in the U.S. which examined the efficacy of the Understanding by Design approach (Trapani and Annunziato, 2018). When assessments were conducted throughout the approach, leaders were able to more accurately understand where motivation or engagement levels were not sustained and use this information to appropriately explore this further with staff. Assessing for readiness is, Trapani and Annunziato contend, a diagnostic tool which can inform decisions and involve staff actively in learning processes around implementing change. Leaders therefore need to consider the potential for needs to work in a non-linear or unpredictable manner, they may require further inquiry, re-visits to previous training where confidence remains shaky, or other unanticipated outcomes. There needs to be degrees of flexibility to respond appropriately and with depth to what emerges from needs assessments. This suggests that whilst needs assessments require consistent engagement and involvement from implementers, the process each time may require more or less time to explore and examine the findings dependent on what emerges.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold relevance to assessing for readiness and identifying facilitators and barriers. As indicated above *agents for change* who allow adequate time for school members to consider, express, and discuss how well they feel able and willing to adopt new practices are important in assessing readiness (Leung, 2020; Gorard, 2020). This implies the importance of considering perspectives and attitudes in relation to current practices and the adoption of changes that will be necessary due to the adoption of a particular *intervention* and its associated *features* and characteristics (Beidas, 2012).

However, the *enabling structures* that are either already present, or absent within the school organisational systems are key to establishing a comprehensive understanding of facilitators and barriers. The focus on enabling structures is therefore key to the context of establishing an accurate picture of readiness and how this evolves over time (Koh, 2020). Firstly, inquiry into what current structures may help or hinder implementation can help to establish a more effective process of identifying facilitators and barriers based on a greater balance of power sharing between leaders and other staff (Desimone, 2002). This approach of *engaging voices* can indicate the ways in which current structures may require adaptation or de-implementation to support new practices and, furthermore, enable staff to examine the feasibility and acceptability of such changes (Maxwell et al., 2019). This means that staff can use a range of data (in this case perspectives and self-reported views on capabilities and capacities) to gauge better how current organisational systems and procedures are influencing perceived readiness (Beidas, 2012). For pupils, *engaging* might focus more on establishing needs and interests. Other necessary elements of readiness, such as relative priority or the perceived prioritisation of the intervention in relation to other practice which has been linked to schools sustaining an approach over time despite challenges, can also be actively explored through engaging school members with inquiry around readiness (Hudson et al., 2020).

Our realist synthesis indicated how inquiry into enabling structures sets the context for assessing readiness to trigger the mechanism of *engaging voices* and understanding in relation to implementation. The key aspect that seems to underly effective assessing for readiness and identifying barriers is engaging a range of different individuals who can then draw on their perspectives to provide a fuller picture of whether a school is ready and identify a range of barriers or potential barriers. Assessing for readiness identifies how established structures and systems can help or hinder implementation and which are necessary to develop to support practice (Cook et al., 2019). This impacts on acceptability, feasibility, buy-in, and sustainability as indicated in the ICAMO configuration below.

Other programme theory mechanisms are indicated. The iterative nature of assessing for readiness and calls to revisit inquiries throughout all stages of implementation implies the *reflection* that ongoing assessment enables (Arnold, 2021). Therefore, compared to other iterative and evaluative structures, reflection is happening before and after this strategy, rather than indicated in assessing and identifying per se, the key is how a range of stakeholders are engaged in a representative assessment of readiness and barriers. The way that assessment of facilitators and barriers helps to

establish coherence and continuity of effective practices also implies processes which *unite* values, understanding, and attitudes (McLoughlin et al., 2020).

ICAMO configuration

When schools assess for readiness and identify barriers and facilitators, attention to enabling structures helps to investigate the ways in which current structures align and will enable new implementation practice to take place and which structures may pose barriers. Our analysis suggests that engaging in iterative inquiries which seek to explore the capabilities, motivations, and capacities of staff and pupils and how these evolve over time can help to build awareness around what structures may help or hinder implementation. Readiness is not only a consideration during explore stages but is an evolving concept that requires revisiting throughout implementation. Therefore, enabling structures including time, is needed for assessments of readiness to take place. Furthermore, capturing the extent that current resources can be integrated into new practices can help to establish a clearer understanding of current levels of readiness as well as the associated facilitators and barriers, which can aid adoption and the sustainment of a suitable approach as well as an increased awareness of implications stemming from adoption of new practices. Those tasked with implementing change should be engaged in assessing readiness in meaningful ways that foster inquiry and teamwork. The cited research often assumes that senior leaders undertake processes of assessing for readiness. However, research indicates that the school leader's ability to listen and observe an authentic account of staff and pupils' perspectives and critically embed these perspectives into joint decision-making, wherever possible, plays a role in identifying the insightful understanding of facilitators and barriers. When organisational structures create the foundations to engage staff through providing time and space, leaders can facilitate discussions around what priorities need addressing and how they have developed. Staff can then be supported to better identify and voice what priorities and preferences have emerged and why. This can impact on several implementation decisions including selecting the most suitable evidence informed approach for their context, informing subsequent planning, and empowering staff through sharing experiences, learning, and expectations. The identification of facilitators and barriers helps implementation leaders to understand better what type of implementation is necessary, what type will work, and under what conditions. Engaging all members of the school who will play a role in, or be influenced by, implementation in ongoing assessments of readiness helps to build reciprocal relationships which over time may develop greater degrees of trust, transparency, and mutual learning.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 1: Assess for readiness and identify barriers and facilitators				
<u>C</u> ontext	<u>A</u> ctor	<u>M</u> echanism	<u>O</u> utcome	<u>E</u> vidence
Enabling structures which facilitate the collection, interpretation, and dissemination of readiness data	School leaders/senior implementation leaders	Engaging voices across the school community helps to assess collective readiness and identify a range of barriers through the collection and dissemination of data.	Intervention fit, feasibility, buy-in, pupil outcomes	Desimone (2002); Beidas (2012); Durand (2016); Maxwell (2019); Leung (2020); Gorard (2020); Hudson (2020); Koh (2020); McLoughlin, (2020); Arnold (2021); Flaspohler (2012)
CERQual confidence rating: Low				

Summary

There is limited but compelling evidence from small-scale research that assessing for readiness is a beneficial strategy in line with other related actions. It is also indicated in other studies, including reviews, as one of a range of implementation strategies that is linked with positive implementation and pupil outcomes. Assessing for readiness shows benefits in relation to feasibility, appropriateness, and in relation to implementer wellbeing. This was the case where understanding concerns informed decision-making which boosted motivation and trust between implementation teams (Hall, 2013 and Trapani and Annunziato, 2018).

Our realist review synthesis shows how structures which enable the school community to engage in processes of feeding back to leadership around perceived readiness help to increase intervention fit. When readiness is assessed iteratively and used to inform decisions this also may increase the likelihood of longer-term sustainability of an approach.

The ICAMO configuration for 'assess for readiness' is rated with a lower level of confidence, however, this is due to a lack of studies which have deliberately examined assessing for readiness and evaluated its scope and impacts. Most of the evidence looks at readiness alongside other strategies and so the risks that impacts are influenced by other factors may be higher. Coherence is also a concern as enabling structures are a condition for the assessment but assessment of readiness and barriers may relate to enabling structures for the intervention. Engaging a representative range of staff is key, yet reflection is also inherent as part of the strategy.

23. Conduct local consensus discussions

SISTER Strategy 23, 'conduct local consensus discussions', is described by Cook et al. (2019) as including local teachers, staff, and other stakeholders in discussions that address whether the identified problem/need is important and whether the new intervention selected to address the identified problem are appropriate.

Definitions in the literature

Local consensus discussions can occur at various stages of implementation and can help to identify priorities as well as explore how stakeholders perceive implementation practice. Local consensus discussion includes 'teachers, staff, and other stakeholders in discussions which address whether the identified problem/need is important and whether the new practices to address the identified problem are appropriate' (Cook et al., 2019, p. 923). They can be conducted at any stage of implementation, although the evidence shows that they are often carried out during the initial phases of implementation when the outcomes of buy-in and feasibility may be particularly relevant and before too much preparation has occurred.

To what extent does the evidence indicate outcomes?

Evidence indicates that conducting local consensus discussions links to several implementation outcomes including feasibility, acceptability, and buy-in. Moreover, community participation in decision-making around implementation is evidenced to be a predictive factor for programme sustainability (Durlak and Dupre, 2008). Studies that indicate the impact of conducting local consensus discussions tend to be small scale and qualitative or mixed-methods.

Smith and Engelsen (2013) interviewed two school principals from Norwegian schools that had participated in a three-year project aimed at establishing an assessment for learning culture. This study provides evidence that discussing shared criteria for the intervention with all staff who would be involved was considered important by these school leaders. It helped to adapt to local needs, which was necessary for the criteria to be adopted. The evidence suggests there needed to be consensus for adoption of the intervention.

Leis et al. (2017) conducted a mixed-methods study investigating the relationship between successful implementation of a professional development and coaching model designed to build trust and enhance communication among colleagues in schools and changes in teacher-leadership trust in eight U.S. schools. Level of implementation was measured using the Implementation Process for Teams measure of competence and commitment to the 'Leading Together' intervention. This allowed comparison between schools scoring higher versus lower on implementation outcomes. The findings suggest that everyone involved in the intervention needs to understand the purpose of the programme and how it fits with priorities for the school. This purpose needs to be explained transparently to the rest of the staff when the programme is being introduced. Although discussion to achieve this consensus is not indicated, this was an inherent part of the intervention. The authors argue that this would be relevant for other interventions too.

Tunks and Weller (2009) explored the levels of engagement in implementation among ten members of staff involved in the delivery of an algebraic thinking approach in the U.S. school context. Their analysis suggests that conducting conversations around the needs of staff at regular intervals with the aim of consensus to align practice was able to generate a better understanding of the factors inhibiting implementation.

This implies that a lack of consensus (coherence, unity, and ownership) among implementers resulted in less buy-in and engagement with the approach, which effected levels of implementation. This also indicates a connection between SISTER Strategy 4, 'conduct local needs assessments', and Strategy 23, 'conducting local consensus discussions'. The process of collecting and analysing the needs of stakeholders generates an understanding of where needs align and where they require alignment to improve the effectiveness of implementation. This was found to be the case in a study of the characteristics of school improvement (Reezigt and Creemers, 2005) which found that increased ownership of the new intervention as well as the improvement of the school more broadly was associated with effective school improvement.

The above is also supported by Frigge et al's (2019) qualitative evaluation of the expanded school breakfast programme in rural Midwestern high schools in the US. The evaluation found that working to modify the programme in line with the

values of stakeholders built consensus and developed greater coherence and cognitive participation of community members. Furthermore, taking a student-centred approach to the intervention and collaborating with staff and students to define and develop a modified school programme was found to assist with both implementing and integrating the programme into the school environment by generating buy-in, acceptance, and feasibility (Frigge et al., 2019).

Waller et al. (2017) also found that reflective collaborative working involving educators and practitioners should be conducted with greater frequency and depth to ensure the utility and salience of an intervention to the individual school context. Furthermore, working collaboratively to develop implementation strategies which 'comprehensively consider the implementation outcomes, such as adoption, feasibility, and acceptability in practice, would be advantageous and would contribute to increasing the effectiveness of interventions seeking to reduce tobacco and substance use in adolescents' (p16). Working collaboratively can be achieved through conducting consensus discussions which may help to explore and examine perceptions, values, and understanding of stakeholders in ways that help inform decision-making (Durlak and Dupre, 2008).

In summary, two reviews, two mixed-methods studies, and three qualitative studies demonstrate some beneficial impact of conducting local consensus discussions on outcomes that include feasibility, acceptability, sustainability and buy-in. The evidence reviewed suggests beneficial outcomes when the consensus discussions are also an opportunity for collaboration between stakeholders, exploring differences in opinion.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that conducting local consensus discussions has been used primarily during early exploration and preparation stages of implementation when exploring the school communities' priorities and perceptions around practice may help implementation leaders to select and prepare a feasible and acceptable approach. Evidence also suggests that conducting consensus discussions may be particularly valuable when approaching sensitive and complex topics (Pearson et al, 2015). In one study, a key action which was found to encourage adoption was leaders' willingness to examine student and parent experiences of school discrimination. Leaders' choices stemming from their willingness to engage in discussions of sensitive topics was pivotal for implementation, either moving practice forward or slowing or inhibiting progress. Gathering experiences required undertaking consensus-building discussions which can incorporate people's experiences into decision-making around the process and content of implementation practice.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. 'Conduct local consensus discussions' was one of eleven strategies that were pre-planned and used. Researchers encouraged school teams to use school data to action-plan for their local context. Then researchers met with teams and advisory board members to discuss the findings and the support needed. This seems to indicate that the strategy can act like a needs assessment with follow-up planning. This study also saw this discussion of data as relevant once the intervention was being delivered.

The approaches that schools might take to 'conduct local consensus discussions' are highly dependent on the specific nature of the evidence-based intervention, the community context, and individual and shared perceptions concerning the relevant issues related to implementing a new approach (Mogren and Gericke, 2017). This implies that conducting consensus discussions requires creative as well as structured processes. On the one hand, consensus discussions provide an opportunity to share relevant information about new practice, and this can be steered by senior leaders. But achieving an authentic consensus requires the cultivation of shared spaces in which listening can take place that aims to understand where disagreements or misalignments in attitudes may indicate barriers or pinch points which may be likely to impact implementation (Fenton, 2002; Roach et al., 2009). On the other hand, consensus discussions are an opportunity to embrace uncertainty and cultivate processes of exploring, building, and reaching a shared understanding among members of the school community around the need for a new approach and the fit and feasibility of implementing a new approach that is appropriate for a particular context (Pearson et al., 2015). In this way, consensus building is structured and informed by the logistical implications for practice stemming from implementation but it is also creative, relational, and open to modifications based on what is derived from discussions.

In a study that examined the ways in which a professional development approach centred on 'systems coaching' was received by schools in the U.S. context, the consensus (around the priority area and appropriateness of practice) among the school community was monitored during the earliest stages of adoption by measuring the frequency and depth of conversations taking place about the implementation in relation to professional identity and values. The study also tracked the extent to which staff members became more 'willing and confident in their ability to provide consensus-related training and information to others', the increase in the degree to which the staff were receptive to using data to make decisions, and the general attitude changes that occurred over time (March et al., 2020, p. 226). This suggests that it may be useful to revisit and re-engage with stakeholders via consensus building at various stages of implementation, not just during the early exploration (Alonge et al., 2020; Frigge et al., 2019). The recognition that views and values change implies that consensus itself is changeable to contextual factors and therefore important to incorporate throughout the implementation process (Cane and Oland, 2015; Savage et al., 2011). This echoes the value of revisiting needs assessments to establish how attitudes towards and perceptions of an approach are evolving in real time in response to practice and environmental adaptations (Koh and Askeff-Williams, 2021).

What does the evidence tell us about how the strategy works well?

Reviews have also identified consensus building as beneficial practice from amongst a range of implementation strategies. Gee et al. (2021) conducted a thematic synthesis of barriers and facilitators to implementation of psychological intervention for adolescents and recommend that young people and all school stakeholders involved in implementation should be involved in the selection of interventions to ensure they are 'acceptable and practical to deliver within the logistical constraints of the school environment' (p.34). This suggests that conducting consensus decisions may play a particularly valuable role when exploring interventions that fit school priorities. Conducting consensus building around needs and priorities can reveal key concerns and priorities for individuals and groups. For instance, a review of the sustainability of public health interventions in schools found that alongside other more established facilitators of sustainability 'staff observing a positive impact on students' engagement and wellbeing' (Herlitz et al., 2020., p.1) was a key priority for sustainability. Without eliciting the types of explorative inquiry associated with conducting consensus building amongst stakeholders, it remains challenging for implementation leaders to understand what motivates implementers. However, through conducting local consensus building conversations, senior leaders can better ensure sustainability from the start by fostering buy-in, acceptability, and feasibility through engaging members of the school community in an active and involved change process (Hall, 2013; Koh and Askill-Williams, 2021).

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

The evidence suggests that conducting local consensus discussions helps to build the supportive foundations for change, such as shared objectives which are acceptable to, and feasible for, those involved. Fixsen et al. (2005), drawing upon education and other fields, suggest that community participation in decision-making is a key supportive foundation for building consensus around change. March et al. (2020) elaborate further on this point by outlining how specific consensus development strategies include 'consensus-focused conversations' that improve the accessibility and engagement of senior leaders by visiting teachers' classrooms, using school data to evidence need, and focusing on problem-solving. Consensus building, therefore, is thought to play an important role in exploring the values that underpin a priority area, the resonance and fit with a specific approach, and how these interact with values at an individual level and at a wider school community level.

What does our realist review show are relevant contexts and mechanisms?

Our analysis suggests that *agents for change* across the school community play an instrumental role in *uniting* values, understanding, and goals during local consensus discussions (Frigge et al., 2019). Where values, perceptions, or priorities differ, senior leaders may be required to mediate perspectives to examine the relevance and evidence of the approach and its potential role in wider school development plans, alongside its relevance to pupil needs (Shoesmith et al., 2021). They may undertake processes of bridging and brokering attitudes and perceptions to actively address questions and concerns expressed by wider staff members about the implementation process, including its impacts on resources, such as time and workload expectations derived from new roles and responsibilities, as well as the possible effects of the implementation and the implications for professional identity (Asada et al., 2020). In contexts where values are expressed and explored in a mutually supportive environment, senior leaders can effectively examine the perceptions of staff and gain insights into positive collective action (Frigge et al., 2019). This can subsequently shape the direction of travel for implementation by indicating the degrees of acceptability and buy-in among staff members and what types of specific training are required at both individual and group levels and when (Tunks and Weller, 2009).

Our analysis indicates that stakeholders may be more supportive of an approach over time if they understand how and why it can address a priority and how it aligns with their own professional values and identity (Pearson et al., 2015). Therefore, purposeful inquiry into the extent to which stakeholders can be *united* in valuing the intervention may be an indicator not just of the level of receptivity to a new approach but also of the likelihood of longer-term sustainability (Herlitz et al., 2020). Consensus-building processes which are actively nurtured over time may be valuable in ensuring that stakeholders have an approach that is coherent and compatible across various time points of an implementation and increase sustainability (Koh and Askill-Williams, 2021; Pearson et al., 2015; Tunks and Weller, 2009).

ICAMO configuration

When thought is being given to how to conduct local consensus-building discussions, all members of the school community need to be considered and, where appropriate, brought into facilitation processes in several ways to unite values, understanding and, goals. Agents for change can act as facilitators: they can ask open questions to explore stakeholders' perceptions of, and attitudes towards, the priority area and the processes of implementation. This active style of inquiry aims to understand perspectives, to draw connections between similar perspectives, and to mediate differences between different perspectives. Agents for change can therefore help to establish shared values, which can motivate and unite wider implementation teams. Any member of the implementation team can be a facilitator although during early phases of the process it may be helpful for senior members of the implementation team to take a lead to model the types of open questioning and active listening that can move understanding forward towards informed decision-making. Similarly, school leader involvement is essential in a context where consensus is unlikely to be reached or needs to be established quickly. Exploring how an intervention unites the professional values of both the school as a

whole and the individuals delivering the intervention can help stakeholders to actively explore concerns or questions concerning a new approach. More accurate assessments of feasibility can empower staff to express differences in preferences, reveal misconceptions, and unite around shared goals. Examining the values that the school community hold may also indicate the potential for the longer-term sustainability of an approach. For example, regular dialogue which engages with the attitudes and perceptions across all stages of implementation can help to mediate events such as voltage drop and programme drift, which occur when there is a lack of motivation, capacity, or capability of one or more members of staff due to a range of factors. These experiences can be explored proactively through discussion which unites stakeholders by facilitating inquiries which focus on problem-solving. Conducting local consensus discussions appropriately involves a range of facilitation skills to ensure that professional values across the school community are heard, acknowledged, and acted on. Where possible, commonalities should be drawn out and differences should be bridged to achieve the collective objective of making progress in response to pupil needs.

Implementation Strategy 23: Conduct local consensus discussions

—which include local teachers, staff and other stakeholders and address whether the identified problem/need is important and whether the new practices designed to address the identified problem are appropriate.

Context	Actor	Mechanism	Outcome	Evidence
Agents for change (facilitate collective inquiries into values)	School or implementation leaders (in early phases); a wide range of school staff are involved in discussions	Uniting (through acknowledging and addressing concerns and individual values, facilitated consensus discussions help to unite values around an area of need and potential interventions to address this)	Facilitates a greater depth of understanding and informs decision-making: Feasibility Acceptability Buy-in Sustainability	Reezigt and Creemers, 2005; Tunks and Weller, 2009; Gee et al., 2012; Pearson et al., 2015; Frigge et al., 2019; Asada et al., 2020; Herlitz et al., 2021; Shoesmith et al., 2021

CERQual confidence rating: Moderate

Summary

The programme theory helps to show how, in consensus discussions, agents for change leading implementation actively unite values around the nature of professional roles, identity, and perceptions relative to priority areas and implementation practices. The primary way in which programme theory does this is by helping to illustrate what processes of consensus building involve, what transferrable principals or guidance might be helpful according to the evidence, and who needs to be involved and when. The processes of consensus building involve active facilitation by trained and motivated members of the school community to elicit perspectives and attitudes from across the community. Facilitation should seek to explore and acknowledge differences, draw out commonalities, and, where possible, unite values around a common goal.

There are some concerns about the adequacy of the evidence contributing to the review finding as there is not that much specific evidence about local consensus discussions compared to other strategies. These consensus discussions can also vary according to context too. The ICAMO configuration is therefore rated with a moderate level of confidence.

5. Develop a detailed implementation plan or blueprint

Description of SISTER strategy

SISTER Strategy 05 is 'develop a detailed implementation plan or blueprint'. The plan is defined as including intended goals and outcomes to be achieved, as well as the process and strategies that will be used to achieve those goals. It is categorised by Cook et al. (2019) as an evaluative and iterative strategy: the plan should be used and updated over time so it can continue to guide implementation.

Definitions in the literature

Implementation planning as a strategy for schools has been defined as involving 'adapting intervention steps to the implementation context, providing detailed logistical planning, as well as identifying implementation barriers and developing strategies to address them' (Sanetti et al., 2015, p. 209). There is a distinction between planning as a process and the implementation plan as the output of this. However, even when assessing the impact of implementation planning as a strategy, most researchers do not define the terms. Planning is often indicated as providing an opportunity for teamwork and sharing ideas by providing a flexible structure which can help those implementing to seek out the links between the objectives of an approach and pupil needs and context (Bohanon et al., 2021) and consider where and how adaptations might be helpful to make sure an intervention is feasible in practice (Dyssegaard et al., 2017). The SISTER strategy specifies that a detailed implementation plan as an output should include:

- (1) aim/purpose of the implementation;
- (2) scope of the change—e.g., who and what settings will be affected;
- (3) goals/outcomes to be achieved;
- (4) timeframe and milestones;
- (5) appropriate performance/progress measures; and
- (6) specific strategies that will be used to attain goals/outcomes (Cook et al., 2019).

Other similar checklists for the contents of a plan exist (An et al., 2021) but the assumption that an implementation plan is a living document that is revisited and reviewed over time holds across evidence (e.g. Stewart, 2008).

To what extent does the evidence indicate outcomes?

Our review of the literature located several studies that show the beneficial impact for schools of developing an implementation plan as a strategy on outcomes including fidelity, sustainability, adoption, and pupil behaviour outcomes.

Sanetti et al. (2015) evaluated implementation planning as a strategy for increasing the fidelity with which four elementary school teachers implemented individualised behaviour support plans after work with behavioural consultants. A multiple baseline design was used to evaluate the impact of teachers using implementation planning as a strategy. Implementation planning resulted in an increase in fidelity as well as beneficial pupil outcomes in terms of academic engagement and disruptive behaviour, but there was a reduction of these effects at one- and two-month follow-up, indicating implementation planning may not be sufficient to sustain improvements.

In contrast, Belansky et al. (2013) explored the use of implementation planning in whole-school approaches to healthy eating and physical activity. Ten rural elementary schools were randomised to either School Health Index, a self-assessment guide to planning health promotion policy or practice, or an adapted version of intervention mapping. The intervention mapping approach was described as more strategic and involved external facilitators, who led twelve two-hour planning meetings, ran needs assessments, suggested interventions, and guided planning implementation including who is involved, steps to take, barriers, and changes necessary. This intervention mapping informed planning led to more interventions being adopted by schools and more sustained changes a year later compared to schools who applied the School Health Index planning model with less structure.

Zhang et al. (2021) focused upon the time elementary schools allocated to planning and consultation and how this impacted fidelity and pupil outcomes: 158 schools were implementing different interventions as part of Tier 1 school-wide positive behaviour support. They found that time allocated for purposes of staff reflection, collaboration, and planning demonstrated strong positive associations with pupil outcomes of school-level suspension rates and this association was stronger than the one between time allocated to professional development and the same pupil outcomes. The relationship was mediated by fidelity—meaning that when time for planning and consultation increased fidelity, pupil outcomes were more likely to improve. Planning therefore may impact fidelity and pupil outcomes but only when sufficient time is provided.

Other reviews have identified planning as beneficial from amongst a range of implementation strategies. Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional, and behavioural needs. They found a large beneficial effect on fidelity for studies that reported using action planning strategies compared to studies that did not.

Implementation planning has also been shown to impact sustainability in a review that identified factors contributing to sustained interventions (Cooper et al., 2015). Large effect sizes suggested that including financial planning and planning for how to integrate a programme into schools beyond research studies were predictors of programmes being sustained after two years.

Walker et al. (2022) found similar when conducting a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. They concluded

that strategic planning was important for sustaining the physical activity approaches used, but also for their adoption too.

McLoughlin et al. (2022) evaluated a school wellness programme to assess implementation outcomes of adoption, fidelity, and penetration. Mixed-methods data collection from 52 U.S. schools took place. A wide range of implementation determinants were reported in the study. The use of planning as a strategy in schools was found to be positively associated with both fidelity and adoption outcomes at a statistically significant level, although this was not the case for penetration.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. Implementation planning was one of 37 implementation strategies used by stakeholders including researchers and school staff. Developing an implementation plan was linked to fidelity as an implementation outcome and the plan initially developed was updated over time and was used to specify which staff delivered sessions.

Similarly, Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Plans were created, updated, and recreated as often as necessary for each implementation team, as part of an ongoing iterative process of assessing, planning, and implementing. This was supported by a coach, a trained expert in the interventions assigned to each school. Researchers concluded that reviewing plans was particularly important as this was mentioned as supporting implementation by 19 schools.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies. They rated developing implementation plans as both an important and feasible implementation strategy for use in schools. Similarly, Connors et al. (2022) asked school mental health practitioners and researchers to rate the importance and feasibility of implementation strategies to increase school mental health providers use of measurement-based care (collection and use of student data throughout treatment). Six strategies were rated as particularly important and feasible, this included 'develop an implementation plan'.

In summary, several small scale studies demonstrate the beneficial impact of developing implementation plans on outcomes that include adoption, fidelity, pupil outcomes, and sustaining the intervention. Other studies, including several reviews, indicate developing implementation plans as an implementation strategy that is well-used, considered important and feasible, and again positively impacts fidelity. The evidence suggests beneficial outcomes when plans are revisited and adjusted based on real-time data gathered, when external support is available to school staff developing the plan, and the necessary time for planning is allocated. Increased fidelity of evidence informed practice through implementation planning suggests that the specification of core components of the intervention, other implementation strategies specified to support introducing the intervention, and sharing the plan with those delivering the intervention may be important aspects of planning.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that implementation plans are used when implementing a wide range of interventions in schools, from changes at a whole- school level (Zhang et al., 2021) versus targeted and individualised interventions (Gunderson et al., 2021; Sanetti et al., 2015). There is evidence that developing an implementation plan has been used beneficially across a wide spectrum of evidence informed practice in schools ranging from behaviour management (Savage et al., 2011) and health related interventions (An et al., 2021; Cassar et al., 2019) as well as learning (Dyssegard et al., 2017; Silva et al., 2021).

Planning can be used to respond to school context. For instance, Fernandez et al. (2019) discuss how planning was used in implementing the Focus on Strength programme, a school-based physical activity intervention. It was reported that a formal planning team helped to adapt the intervention for the specific school context where capacity in the curriculum for additional lessons was limited. The planning team made adaptations to pre-prepared plans (designing bespoke resources to better reflect the school context and reducing the amount of time during PE lessons for the intervention) which improved feasibility, facilitated adoption, and helped sustain the programme. Similarly, a qualitative study indicated that flexibility to adjust implementation plans for a behaviour management intervention in response to the specific needs of the school context was perceived to be key to generate buy-in from staff involved (Savage et al., 2011).

There is an apparent tension in the literature between planning used earlier to explore needs and assess readiness versus the assumption that planning helps to prepare to deliver an identified intervention into practice. Several models of implementation specify planning as a step when schools are preparing for the introduction of an intervention into practice. These models include the Quality Implementation Framework (Meyers et al., 2012), Activity Theory (Cane and Oland, 2015), Knowledge Translation Framework (Gagnier and Fisher, 2020), and PROSPER (Nordstrum, 2017). Research that has considered the use of a range of SISTER implementation strategies also categorise developing an implementation plan as part of the preparation phase of school implementation (Gunderson et al., 2021; Moore et al., 2021).

However, other models suggest planning starts earlier as implementation is explored (Burke et al., 2018). In Fixsen et al.'s (2005) model of community readiness for the introduction of change, the concept of pre-planning is described as an early process of exploration which involves identifying the need for change. Specific to education, a scoping review identifying factors that contribute to the effectiveness of diabetes-related interventions in U.S. schools similarly reported that practical implementation plans should identify the problem that an intervention addresses, linking this to goal setting, and that planning should assess readiness for change (An et al., 2021).

Other studies amplify the iterative nature of plans indicating that planning continues throughout implementation phases and therefore initial plans need to be flexible to adapt to the needs of pupils, staff implementing, and wider environmental factors as well as ongoing data collection (Gabby, 2016; Fernandez, 2019; Cannata, 2020). This is also indicated in some implementation models where planning is seen as part of ongoing improvement cycles (e.g. Active Implementation Framework, Ryan Jackson et al., 2018). This highlights the element of revisiting plans as part of this strategy.

Lane et al. (2022) analysed data collected from a mixed-methods trial of a physical activity intervention in Australian Primary Schools. The PACE intervention includes eight implementation strategies including developing an implementation plan. Findings show that developing a plan is useful in mitigating against the impact of staff turnover as roles and goals are specified.

Although an implementation plan is initially developed early in the implementation process and then revisited and adapted over time, research has demonstrated the benefit of planning for sustainability. A longitudinal, qualitative research study of 24 staff from schools implementing a programme to reduce bullying in elementary schools across two years suggests having a plan which specifies the ongoing support needed for continued use of an intervention is associated with stronger fidelity (Leadbeater et al., 2015). This is supported by Bohanon et al. (2021) who show in their survey research how building implementation planning into broader school improvement planning can benefit pupil behaviour outcomes.

What does the evidence tell us about how the strategy works well?

Some of the characteristics of effective planning have already been mentioned: plans are revisited and revised (Gunderson et al., 2021); plans specify staff who are involved (Albers and Pattuwage, 2017; Moore et al., 2021); plans include long-term sustainability (Cooper et al., 2015; Leadbeater et al., 2015); plans identify actions to implement the intervention in the specific school context (Savage, 2011).

Redding et al. (2017) provide evidence that teamwork involved in developing an implementation plan can improve ownership of implementation when those involved in creating the plan identify barriers and strategies to address these challenges proactively. Whilst the causal links are uncertain, the research indicates that in establishing an implementation team with capacity and authority to identify supportive action as part of the plan, the intervention is then more sustainable. In their evaluation of Mixed Attainment Grouping, Roy et al. (2018) also reported that a factor that aided successful implementation was sharing the planning work amongst staff.

In their systematic review of school-based implementation, Albers and Pattuwage (2017) note that implementation plans should be dynamic. This supports revisiting plans regularly and implies keeping them flexible, using ongoing data collection as the intervention is put into practice to tailor plans in response to outcomes. Data and planning hold a reciprocal relationship. Plans indicate data collection, while ongoing monitoring of data informs decisions about adapting and even stopping implementation (Bohanon et al., 2021). Albers and Pattuwage (2017) also report that staff delivering an intervention should input into, or be represented in, planning. This movement toward ownership can help increase accountability and buy-in by ensuring that stakeholders can express their own professional judgements around planning and the ways in which an intervention can meet pupil needs.

Some studies suggest that planning as a process provides a platform for other implementation support, such as networking and understanding the core components of an intervention (Alonge et al., 2020, An et al., 2021). Collaboration in planning establishes what support can be offered by different stakeholders and how this may be complementary rather than duplicate effort, particularly when an intervention involves key actors both within and outside of the school (Alonge et al., 2020).

Several studies state that one purpose of planning is to consider the relationship between the new intervention and current practice (e.g. An et al., 2021; Frigge et al., 2019). Identifying a lack of overlap or a lack of available resources can help to identify which areas of current practice may not align with the aims of the new approach and why (Cane and Oland, 2015). Current practices may undermine a new intervention, thus indicating what may need to be de-implemented so previous practice does not compete with the new intervention; this can increase or maintain staff capacity (Dyssegaard et al., 2017; Bohanon et al., 2021).

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Several empirical studies show that developing implementation plans can be enhanced by providing the necessary time to develop and evolve plans (Cane and Oland, 2015; Durand et al., 2016; Zhang et al., 2021). Overly ambitious plans and rushed implementation timescales can act as a barrier to improved intervention outcomes, with Durand et al. (2016)

showing in their mixed-methods study that this can lead to short-term declines in broad pupil attainment. Likewise, time was indicated as a barrier to effective planning by Chong and Lee (2021). They asked school leaders in Singapore about their use of mental health-related prevention education programmes (typically social-emotional learning and character education). Time constraint was identified as a major barrier to school leaders' ability to ensure fidelity to implementation processes, and to use the wealth of data to inform ongoing planning.

Key stakeholders need to be included or represented in planning. Fagen and Flay (2009) found in a mixed-methods multiple case study design evaluating the implementation of a risky violence, drug, and sex-related behaviours prevention programme in five schools that not including key stakeholders in planning, specifically class teachers who would facilitate the delivery in lesson time, meant that barriers to delivering the programme were not recognised and the intervention was not sustained after one year.

What does our realist synthesis show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold relevance to developing implementation plans. As indicated above, *enabling structures* that allow adequate time for developing and revisiting the plan as well as establishing or drawing upon existing teams to make sure the plan seeks a range of relevant input are important to support the development of the plan (Frigge et al., 2019; Redding et al., 2017). This implies members of the implementation team developing the plan are *agents for change* as they feed in representative views from a wider range of staff (Alonge, 2020).

However, the *intervention* that is the focus of an implementation plan is key to the context of developing that plan. Firstly, the intervention's core components are articulated as part of the implementation plan and therefore identifiable and valued core components support the impact of plans. It is also important to consider specific intervention features in relation to the school context, including pupil needs, resource availability, and the skills and preferences of staff. This means that an implementation plan can carefully consider how features of an intervention can be translated and actioned within the school, which may involve adapting some elements to overcome perceived barriers or achieve a better fit with existing practice (Leung et al., 2020; Reedy and Lacireno-Paquet, 2015). Necessary intervention resources including time, availability of staff, and specific staff expertise should be specified in implementation planning (Frigge et al., 2019).

Our realist synthesis indicated how these intervention characteristics set the context for implementation plans to trigger the mechanism of *uniting* values and understanding in relation to the intervention. The implementation plan sets out core components, key actors involved in implementation, aims and milestones, and indicates the implementation strategies that will be used to help facilitate the intervention being introduced in practice (Cook et al., 2019). This impacts on coherence, capacity, fidelity, and sustainability as indicated in the ICAMO configuration resulting from our realist synthesis below.

Other programme theory mechanisms are indicated. The planning process ought to *engage* a range of voices so that perceived barriers can be identified, and appropriate action discussed and recorded (Fagen and Flay, 2009). The iterative nature of planning and calls to revisit and adapt plans implies the *reflection* that ongoing planning allows (Gunderson et al., 2021; Ryan-Jackson et al., 2018). The implementation plan can also specify the data collection that allows this reflection (Fernandez, 2019). Planning can lead to reflection when a plan provides a flexible structure for ongoing reflection (Bohanon et al., 2021). It also encourages reflection on how school context and needs inform implementation of the approach (Fernandez et al., 2019; Savage et al., 2011). Although the ongoing nature of planning and reflecting on the plan is important, we found more evidence to suggest that the planning helps to unite values and understanding in relation to the intervention and its implementation.

ICAMO configuration for developing an implementation plan

When developing implementation plans, attention to intervention features helps to ground the process of planning. Our analysis suggests that engaging in planning processes which seek to improve the understanding of the core components of an intervention, how the intervention fits with current practice, and the ways in which an intervention can be adapted and translated to meet the needs of pupils and context-specific factors appropriately, can aid adoption and maintain fidelity. Those leading on implementing change should be engaged in planning processes in meaningful ways that foster collaboration and teamwork. The cited research often assumes that an implementation team develops a plan and may draw on external support if available. The team should represent a range of perspectives. This can help to sense-check plans according to differing perspectives and can help to build cohesion and buy-in across implementation activities. Developing and sharing an implementation plan helps to unite understanding and values in relation to the intervention. Through communicating plans with relevant stakeholders and specifying further strategies to support implementation, core components of the intervention, adaptation, and support for introducing the intervention in the school context, the data that will be used to assess impact and review the plan and the fit with current practice is all made clear. This can inform intelligent adaptations to an approach while maintaining the core components, and utilise existing resources efficiently and effectively, helping to sustain the implementation. Detail in the implementation plan helps shared understanding and leads to greater adoption and fidelity. The goals indicated on the plan unite values supporting buy-in and sustaining the intervention over time, which in turn increases the engagement with plans over time.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and CERQual confidence rating.

Implementation strategy: Develop an Implementation Plan or Blueprint.				
This should include the intended goals/outcomes to be achieved via the implementation effort as well the process and strategies that will be used to achieve those goals. Use and update the plan to guide the implementation effort over time.				
Context	Actor	Mechanism	Outcome	Evidence
Intervention features (core components of the intervention are identified, resources are available, fit with current practice and staffing has been assessed).	Implementation team and school leaders may take more responsibility for planning and drafting a plan. Sharing the plan and decision-making affects implementation stakeholders.	Uniting (Uniting understanding and values around the characteristics of an intervention, the data that has informed decision-making, data that will be used to revisit the plan, and goals over time, how an intervention aligns with and evolves current practices).	Implementation outcomes over time are all impacted. Planning that unites understanding and values improves: Buy-in Adoption Sustaining Fidelity Pupil outcomes	Cane and Oland, 2015; Reedy and Lacireno-Paquet, 2015; Dyssegaard et al., 2017; Frigge et al., 2019; Alonge et al., 2020; Leung et al., 2020; Stewart., 2008; Durand et al. 2016; Moore et al., 2021; Cooper et al., 2015; Leadbeater et al., 201; Savage, 2011.
CERQual confidence rating: Moderate				

Summary

Unlike some other implementation strategies, there is evidence that developing an implementation plan is a beneficial strategy in isolation or in line with other related action. It is also indicated in other studies, including reviews, as one out of a range of implementation strategies used successfully. Developing an implementation plan shows benefits in relation to fidelity, sustaining, and some pupil outcomes. Our realist synthesis shows how features of the intervention inform the implementation plan and specifying detail; awareness of school context and revisiting the plan can help to unite understanding and values in relation to a new intervention, helping the intervention to be adopted, put into practice with fidelity, and sustained. This implies evidence of impact on outcomes for plans in relation to an intervention rather than earlier planning around needs and readiness.

The ICAMO configuration for developing an implementation plan is rated as moderate level of confidence. A range of designs inform the analysis including reviews and the evidence holds high relevance to planning. Often though the evidence speaks to a particular aspect of planning rather than coherently showing how the range of components indicated as part of an implementation plan together unite stakeholders' understanding and values about an intervention. As such there are minor concerns about the coherence and adequacy of the data leading to a moderate level of confidence here.

22. Capture and share local knowledge

SISTER Strategy 22, 'capture and share local knowledge', encourages capturing local knowledge from other school sites about how school personnel there were able to implement the new practice effectively in their setting and then share it with those in the implementation site. This is categorised as a strategy to develop stakeholder interrelationships. It is broader than the related strategy 36, Visit Other Sites, where a similar implementation effort has been considered successful. Therefore, we have not analysed strategy 36 separately. It is also related to Strategy 45, 'shadow other experts', a professional development strategy that involves observing experienced use of a new intervention, which may often involve visits to other schools. Here we assume that a key part of the strategy is the sharing of knowledge gained from other sites and consideration of the similarity of the other school setting. Other research has assumed this strategy is relevant to the prepare phase of implementation, although we recognise that learning from other school sites could be part of exploring the feasibility of an intervention and local knowledge could be captured about more specific aspects

of implementation in later phases such as in relation to adaptations and scaling up. This helps to distinguish the strategy from visits as part of professional development to prepare for delivering an intervention.

Definitions in the literature

The strategy seems to imply a one-directional strategic benefit for the school that is preparing to put a new intervention into practice. More often in the literature this relationship is framed as collaboration between schools, and it is recognised that even when it may involve a more experienced school supporting a school new to the intervention there are benefits for both (Bodilly et al., 1996; Leeman et al., 2018). However, it is clear that this strategy is broader than simply visiting school sites as evidence shows how stakeholders working across different school sites who have observed the intervention, seen a range of barriers, and are able to assess similarity between school settings can share this knowledge, which can include examples of unsuccessful implementation rather than only best practice models (Askill-Williams et al., 2013; Moore et al., 2021).

To what extent does the evidence indicate outcomes?

There is some indication that capturing and sharing local knowledge may impact implementation outcomes such as fidelity, acceptability, and sustainability. This comes from a range of study designs including reviews and process evaluations relating to trials of interventions. The strategy is also considered feasible and requested by teachers to improve implementation. However, the impact is not as well evidenced as other strategies and the process of capturing knowledge and sharing it for the benefit of colleagues and to inform specific decisions is less clear. It is very likely that this strategy will only indirectly benefit outcomes but would need to inform other strategies that use the knowledge gained for planning, professional development, and assessing readiness.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. Shadowing other experts was one of 37 implementation strategies used by stakeholders, although here it was researchers as group leaders who discussed challenges, successes, and adaptations made across schools to then communicate across participating schools. Authors report that the use of the strategy targeted fidelity, although the impact on this outcome could not be isolated.

Sichel and Connors (2022) conducted a mixed-methods study with school-based clinicians using a measurement feedback system (technologies that collect and report pupil health data to aid clinical decision-making) to identify determinants of practice and showed other implementation outcomes for this strategy. The latent-class analysis identified clinicians who reported high versus low implementation outcomes such as appropriateness, acceptability, feasibility, and adoption, and this included education support that involved peer-to-peer support including pairing new clinicians with clinicians experienced in using the intervention for consultation. However, participants still requested examples of how to incorporate the measurement feedback system more seamlessly into their sessions with students.

Askill-Williams et al. (2013) developed an implementation index (based on level of fidelity, dosage, and delivery) to measure schools implementing a mental health intervention in Australian schools. These implementation outcomes were measured after two years with some Round 2 schools commencing delivery after one year. External project officers working across schools were better able to differentiate between high- and low-implementing schools than teachers and parents within the school. This suggests that the limited experiences within their own school may have compromised participants ability to assess critically their own position. Schools in Round 2 (so starting the intervention later) reached similar levels of implementation after two years. Project officers would have been able to use their experiences gained working with Round 1 schools to provide more informed and effective support to Round 2 schools. This study therefore suggests that capturing and sharing knowledge from other schools might speed up implementation and also mean schools are better able to accurately assess their position after they have been implementing for one or two years.

Leeman et al. (2018) completed a mixed-methods evaluation of tools used by U.S. schools to support implementation of health interventions. They found evidence that seeking out both high- and low-performing examples of health intervention implementation was beneficial to schools. Difficulties with implementation shared by other schools helps recognise potential barriers to implementation that may be missed or not foregrounded if only collaborating with expert schools who have sustained the intervention. Furthermore, the study recognises that selection of schools to collaborate with should also consider the similarity of the schools. While it may be useful to see an intervention modelled in any school (see strategy 45), learning and continuing to collaborate with a similar setting where findings are more likely to be transferable. Those collaborating with other schools ought to therefore note school and community factors to assess this. This can then help to assess compatibility and predict sustainability (Holmes et al., 2022).

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies: participants considered 'capture and share local knowledge' as one of the five most feasible implementation strategies—but also important too.

Some research shows negative outcomes when there is not the opportunity to capture and share local knowledge. A review by Desimone (2002) of Comprehensive School Reform Models found evidence that slow or weak implementation was associated with a lack of professional development that provides both knowledge and examples of exactly what

the reform looks like in practice. Teachers across studies requested more specific examples of instructional practices that demonstrated the reform and, of particular relevance to this strategy, availability of established schools where teachers could observe the programme. Being able to collaborate with other schools experienced in the reform held the benefit of offering technical assistance to schools new to the programme.

Ikemoto et al. (2016) conducted a mixed-methods process evaluation after a randomised controlled trial of a cognitive tutor geometry curriculum that involved learner-centred strategies in eight U.S. high schools. Overall, there was some negative effect of the intervention curriculum when it was implemented poorly. Barriers to implementation related to capturing and sharing local knowledge. Teachers lacked prior experience with similar interventions and had limited exposure to the curriculum before they used it. This might be addressed through capturing and sharing local knowledge—particularly as teachers often reported there was a lack of support to collaborate with others implementing the curriculum.

In summary, one review, two quantitative studies, three mixed-methods studies, and one qualitative study demonstrate some beneficial impact of capturing and sharing local knowledge on outcomes that include fidelity, acceptability, and sustainability. The evidence reviewed suggests the process of capturing knowledge and sharing it for the benefit of colleagues and to inform specific decisions can be unclear. Fidelity and sustainability are also unlikely to be directly impacted by gaining knowledge from other settings, with the knowledge more likely to inform other strategies.

What does the evidence tell us about the situations in which schools might use this strategy?

A mixed-methods case study conducted by Miedijensky et al. (2018) examined the process of educational change as demonstrated in three Israeli elementary schools implementing education for sustainability (EfS). A recommendation for improving implementation was to visit other schools to observe practice. However, this was more open to considering intervention options, rather than only to learn about delivery of a selected intervention. This indicates the capturing and sharing local knowledge might occur when exploring implementation.

Bodilly et al. (1996) evaluated a range of whole-school reforms using a comparative case study approach. A different example of observing other schools' practice was in the use of critical friends visiting other schools using the same reform programme to provide feedback. Where this was used, it was reported to benefit the critical friend observing, as this encouraged them to better understand the purpose of the intervention and access examples of good practice to take to their own schools. This links to the benefit of ongoing collaboration versus one-off expert-novice partnerships as part of preparing for a new intervention.

What does the evidence tell us about how the strategy works well?

Several studies cited thus far indicate that collaboration with other schools may help to explain one way in which this strategy works well (e.g. Bodilly et al., 1996; Leeman et al., 2018). In their EEF evaluation of Challenge the Gap, a school collaboration programme, West et al. (2017) found that participating teachers often valued visiting other schools and the professional development associated with that. More specifically, the positive perceptions about involvement of their school in the programme was linked to the opportunity to collaborate with other partner schools. This implies that aside from working with more experienced schools when preparing to put a new intervention into practice, there is also ongoing benefit of collaborating with other schools at the same point in implementing an intervention to share learning.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

McHale et al. (2022) aimed to identify barriers and facilitators to implementing a whole-school physical activity intervention in secondary schools in Ireland. One of a range of barriers was a lack of collaboration and therefore researchers suggested that a strategy that ought to be used as part of the programme is creating links between schools at different stages to enable schools more experienced in the intervention to provide advice to schools about to put it into practice, including opportunities to observe the intervention. This collaboration between schools is hypothesised to lead to sharing of experiences and ideas as well as supportive relationships.

Time is also a barrier related to this strategy. West et al. (2017), when evaluating Challenge the Gap, also found that a barrier to collaboration was the perceived time needed to visit other schools. A similar barrier was reported by Reis et al. (2010) in their report of case studies of whole-school reading implementation in U.S. elementary and middle schools. Here the barrier was budget to cover teaching. This suggests that unlike when staff might benefit from visiting other schools, or even teachers within their own institution, to see a new intervention being modelled, capturing and sharing local knowledge might be facilitated in other ways that see collaboration across schools without always necessitating visits.

What does our realist synthesis show are relevant contexts and mechanisms?

Our programme theory contexts of *agents for change* and *enabling structures* are relevant to this strategy. As indicated in the evidence discussed above, enabling structures—in terms of resources and support—may be needed for this strategy (McHale et al., 2022; West et al., 2017). However, collaboration between schools may not require frequent

visits and there is some advantage to accommodating ongoing collaboration as an enabling structure. Therefore, there are key agents for change implicated in this strategy. Both staff at other schools or implementation experts who can share knowledge from across school sites are important as their expertise and knowledge is necessary but not sufficient for the strategy to be effective (Phillips et al., 2017). Those staff in the school putting in place the new practice are also key agents for change as the strategy implies they share the knowledge to help maintain fidelity and address any relevant potential barriers that have been recognised elsewhere. The mechanism of *reflection* seems important as it may be that the agent for change in the implementing school needs to carefully consider the transferability of experiences in other schools, both in terms of which schools to collaborate with and how to interpret their experiences. However, as this strategy may not always involve direct collaboration between schools and the focus is on lessons learnt in similar situations, this strategy helps *unite* understanding about the intervention particularly beyond its procedural delivery to the experience of implementing it. By sharing evidence of the important factors that have supported implementation elsewhere this can help *unite* values in relation to the intervention and improve buy-in. Arguably *engaging* voices is important, as although the strategy relies on agents for change collaborating and considering implications for the school setting the approach will be introduced to, it can be important to meaningfully engage with differing perspectives about the approach, including individuals who can discuss how barriers and issues with buy-in were resolved. Therefore, our realist synthesis indicated the interaction of *agents for change* and *uniting* impacting buy-in, fidelity, and sustainability outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for capture and share local knowledge

This strategy necessitates agents for change who are collaborating in relation to sharing understanding about how an intervention has been implemented at other sites. The experienced user of the intervention may hold experience in relation to barriers experienced and even de-implementation. This strategy also provides the context for the collaborating school staff member to themselves become an agent for change, by sharing their knowledge and understanding about a new intervention with colleagues. The key actors in this strategy are those collaborating across schools. They ought to be carefully selected so the experienced user has direct experience and the member of school staff may be an implementation team member or champion who can relay the information to others. Collaborating with other users and then sharing this information with colleagues helps unite understanding about the intervention, broadly in relation to barriers to implementation and the necessary implementation strategies that can support successful implementation. Collaboration will give clear examples relevant to practice that can inform broad preparation for the intervention and will often continue as an opportunity for ongoing support. There will be increased buy-in and acceptability in relation to the intervention, particularly for colleagues when knowledge is relayed. Through appreciating facilitators and barriers, fidelity is more likely to be maintained. As experienced users will have sustained the intervention over the longer term, this can in turn aid sustainability through its demonstration.

Implementation Strategy 22: Capture and share local knowledge—including Strategy 36: Visit other sites				
Those involved with the implementation capture local knowledge from the community and other school sites as to how new practices can be implemented effectively in schools. The data gathered is shared with those at the implementation site.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change (learning from experts, building own expertise and sharing knowledge with colleagues).	The experienced user and the school staff collaborating with them, although colleagues will be impacted as information is relayed.	Uniting (Knowledge about implementation success in similar contexts is shared with staff and community stakeholders).	Acceptability Buy-in Fidelity Sustainability	Leeman et al., 2018; Askill-Williams et al., 2013; Holmes et al., 2022; Ismail et al., 2021; Shoesmith et al., 2021; Roney and Daftary, 2020; Ikemoto et al., 2016; Moore et al., 2021; Phillips et al., 2017; Bodilly et al., 1996; McHale et al., 2022; Desimone, 2002.
CERQual confidence rating: Low				

Summary

Some evidence—including reviews and process evaluations relating to interventions implemented in schools—support the potential benefit of capturing and sharing knowledge from experienced intervention users who have seen first-hand the intervention in practice at other schools. When this information is relayed, it can impact on buy-in, acceptability,

fidelity, and sustainability. These outcomes are likely to be caused by improved knowledge about the intervention (uniting understanding). However, in isolation this strategy is unlikely to drive outcomes based on collaboration and sharing this knowledge alone; this suggests the adequacy of the data demonstrating outcomes is limited. It can inform other strategies that consider assessing and responding to barriers, planning delivery, and using information to increase buy-in. Therefore, the ICAMO is rated as a low level of confidence.

57. Involve students, family members, and other staff

SISTER strategy 57 encourages those implementing in schools to consider and engage with those that are not directly involved in delivering a new intervention. These actors can include students, families, and other staff. Engaging with these groups should happen across implementation phases, particularly when the intervention and its impact is of greater relevance for pupils, families, or other staff as recipients or impacted by the change in school practice. We have not analysed 37, Conduct Educational Meetings, as these meetings are also targeted to different stakeholder groups and this strategy about involving stakeholders is broader. Similarly, two other strategies feel more specific than this one and are therefore subsumed in the analysis here: 56, Intervene/Communicate with Students, Families, and Other Staff to Enhance Uptake and Fidelity and 58, Prepare Families and Students to Be Active Participants.

Definitions in the literature

For impact across a school, implementation leaders must consider who is engaged and at what points (Grossi et al., 2019). Involving intervention recipients in planning implementation is considered essential for health promotion interventions in schools (Pearson et al., 2015), and this may well extend to a range of other intervention types. Establishing partnerships with pupils and families can increase involvement and communication between home and school (van Kuijk et al., 2021). Samdal and Rowling (2010) acknowledge that involvement is a prerequisite for individual change. Their evidence about involvement suggests that active rather than passive involvement is key, particularly in whole-school approaches. This helps to empower pupils (Frigge et al., 2019). Family involvement is also used to increase reach beyond the school into the community (Savage et al., 2011).

To what extent does the evidence indicate outcomes?

A small amount of evidence ranging from a review to mixed-methods studies has shown that involvement of students and families can help with buy-in and acceptability of an intervention. Interestingly, there is some evidence that this involvement can impact longer-term behaviours leading to readiness for future involvement and student involvement was associated with fidelity.

Sadjadi et al. (2021) conducted a systematic review to examine factors revealed in qualitative process evaluations that impact the implementation of health promoting school programmes aiming to reduce bullying, aggression or violence. Aside from programme characteristics such as fit with school and national policy, and professional development the review's thematic synthesis highlighted that implementation was enabled by stakeholder buy-in, including support from teachers, pupils and families. The review concludes that agreement about the need for the intervention and commitment to it is needed from all four of school leaders, school staff, pupils, and parents. The review also finds that buy-in from each of these groups is positively impacted by the other group's buy-in. In terms of how these groups are involved or particular strategies to increase involvement and buy-in, the review suggests alignment of the intervention with school aims and national policy support, and demonstrates the need for the intervention. Also, and more specifically, they found the involvement of parents can increase the acceptability of intervention implementation and it should go beyond merely informing them of an intervention to ensure they have clear guidance as to what their involvement entails. Parents can help to extend acceptability to pupils by reinforcing the benefits of the intervention at home. Some of these findings may be related to the Health Promoting Schools Approach, which aims for engagement with families and local communities and may be less applicable with interventions that are not a whole system approach seeking to modify the school environment. Indeed, Samdal and Rowling (2011) note that student participation is an element of World Health Organisation guidelines for health-promoting schools. Yet this review evidences that being involved in decision-making specifically has a range of important impacts in terms of learning, thinking, and community action.

McLoughlin et al. (2022) evaluated a school wellness programme to assess implementation outcomes of adoption, fidelity, penetration, and sustainment. Mixed-methods data collection from 52 U.S. schools took place. A wide range of implementation determinants were reported in the study. However, for experienced schools (those that had prior experience with the intervention) the highest rank positive determinant indicated that student involvement and advocacy was helpful for success. This was also positively correlated with fidelity.

Frigge et al. (2019) evaluated the implementation of an expanded School Breakfast Programme in U.S. rural high schools, interviewing school leaders and food service leaders. Most participants reported the importance of educating families and the school community about the values of the intervention. This is an example of meaningful involvement of students with evidence that students were on planning committees. Those students who were engaged were found to define and create a programme that interested them and their peers. Students made presentations about the school breakfast programme and were involved in collecting data. The student-centred approach was argued to support acceptance and adoption (Frigge et al 2019).

Gregory et al. (2021) conducted qualitative interviews with practitioners using restorative practices as a behavioural approach in U.S. schools. The study aimed to identify components of implementation that supported building infrastructure, increasing staff and student capacity and putting in place different levels of support. Student leadership and voice was one of the components. Findings suggested that student involvement carried over beyond the intervention with other ways in which student advocacy is supported. Family and community involvement was key and rather than just inform families about the intervention it was considered successful as restorative conversations were used to build communities with families. Authors argue that strengthening capacity in this way alongside other implementation strategies such as professional development has helped to sustain the intervention in these schools.

In summary, two reviews and three qualitative studies demonstrate beneficial impact of involving students and family members on outcomes that include buy-in, acceptability, and fidelity. The evidence reviewed suggests beneficial outcomes when students are involved more often than families and other staff, these stakeholders are less often involved in implementation in the literature.

What does the evidence tell us about the situations in which schools might use this strategy?

This strategy is used when buy-in toward a new intervention is necessary from stakeholders and when it is important they are clear about changes in practice. Communication of this information is therefore important. The strategy can also be used when students can be involved in designing actions as part of an intervention. Burriss and Ring (2009) show that support from families is important. They completed interviews with pupils and school staff involved in a school-wide wellness programme. The study shows threats to sustaining an intervention when families are not clear on their role and responsibility in relation to appropriate snacks, birthday treats, and acceptable drinks. Teachers, parents, and children all reporting the need for healthier choices for lunches and breakfast provided initial buy-in, but this did not continue throughout the intervention. Involvement was achieved through parent meetings, newsletters, and personal communication. But it was recognised that this consistent and informed communication needed to continue to promote that the intervention was a shared responsibility across staff, pupils, and parents; the authors argue that this will help facilitate sustainability.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. Involving students, family members, and other staff was one of 37 implementation strategies used by stakeholders including researchers and school staff. The research team let pupils know about the intervention through assemblies and classroom visits. Pupils participated in sessions including in leading some activities. Although the strategy focused on acceptability and adoption it is unclear the impact this had compared to the wide range of other strategies used.

Mclsaac et al. (2015) completed an exploratory mixed-methods case study focusing on the implementation of Health-Promoting Schools in nine Canadian schools. Their analysis showed that in the four schools sustaining their health-promoting practice, the intervention was supported by community partners and committed school staff. These schools also involved students meaningfully. There was evidence of student-centred learning, skill development, and engaged students. For instance, one school had a student action team that designed activities and developed a healthy snack initiative.

To create positive student perceptions and acceptance of interventions, evidence shows students can be empowered to lead in defining and recognising the priority and lead communication to introduce the new intervention (Frigge et al., 2019; Hudson et al., 2020; Sadjadi et al., 2021; Bonell et al., 2015). When students' preferences and demands for improvement is not heard or acted upon, students do not support new interventions and there can be resistance to change (Anselma et al., 2020; Giraldo-García et al., 2021; Kodish et al., 2020; Ronto et al., 2020). When the intervention seeks to improve pupil outcomes, relationships between students and those delivering the intervention are key. Students need to be treated with respect (Giraldo-García et al., 2021; Sadjadi et al., 2021).

To achieve buy-in from all stakeholders, shared understandings and expectations need to be cultivated by school leaders through listening to stakeholders (Ryan Jackson et al., 2018; Trapani and Annunziato, 2018; Allen et al., 2021; Goodman-Scott et al., 2018; López-Yáñez et al., 2013; Tancred et al., 2018; Hopfenbeck and Stobart, 2015; Durand, 2016; Williams et al., 2021; Nachmias et al., 2004; Distel et al., 2019; Hu and Veen 2020).

To gain parent and family support, families should be made aware of the planned changes. Communication needs to encourage parent engagement and advocacy (Gee et al., 2021; Wilhelm et al., 2021; Allen et al., 2021; Goodman-Scott et al., 2018; Gregory et al., 2007; Hu and Veen, 2020). Mendenhall et al. (2013) recognise that parents and the wider school community need to be educated about new approaches.

What does the evidence tell us about how the strategy works well?

Some evidence shows that this strategy works well when it means the intervention can respond to stakeholder concerns, often in relation to the need for change. Sharing stakeholder views across groups can also help awareness of needs, although differences in perceptions need to be carefully considered, implying the importance of using data collected and ongoing involvement. Van Kuijk et al. (2021) systematically reviewed quantitative and qualitative evidence related to the implementation of Success for All in Primary Schools. Less than half of schools in reviewed studies appeared to be

implementing the programme at a greater than minimal level. The review evidences a range of barriers; parent and family involvement was shown to be a barrier across five studies. The intervention involves putting in place a family involvement team. However, reviewed studies showed that this was not always in place and when it was, school staff were unaware of its purpose. While this shows that some interventions include a family involvement component, evidence suggests that schools may be able to leverage existing family involvement channels rather than put in place additional groups.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. School staff used this strategy to involve parents and carers, although this was with mixed success and depended on community support for this type of initiative. Some teams noted that it was important to make sure the intervention was responding to student perspectives on LGBTQ issues and therefore this pupil involvement may lead to adapting interventions.

Engaging staff, families, and pupils not directly involved in planning and delivering a new intervention can lead to a shift in power. Savage et al. (2011) reported in an interview study with school leaders implementing a health intervention that leaders had to consciously both empower pupils and families, to give them space to provide feedback and to a certain extent disempower themselves as school leaders.

Leeman et al. (2018) completed a mixed-methods evaluation of tools used by schools to support implementation of health interventions. Study findings supported the involvement of parents influencing adoption of interventions by school staff. This was particularly the case when parents played a role in advocating for healthier schools.

While Azad et al. (2021) were evaluating home-school interventions for children with autism spectrum disorders, the study is useful as it considers aspects related to fidelity outcomes and alignment to the intervention components used by both parents and teachers. Parents reporting higher quality relationships with the class teacher showed more alignment in intervention delivery and greater communication between teachers and parents also predicted this alignment. This suggests the importance of the relationships between different stakeholders who might be involved in school-based implementations affecting level of alignment and working together.

Chong and Lee (2021) asked school leaders in Singapore schools to complete a SWOT analysis in relation to their use of prevention education programmes (typically social-emotional learning and character education). The analysis showed that parental pressure can be a barrier to teacher buy-in when focus is placed more on academic outcomes. This suggests the importance of communicating intervention aims and purpose to a range of stakeholders and that involvement that demonstrates negative perceptions can be a barrier to implementation.

Martinez et al. (2019) discuss the importance of student voice in relation to Positive Behaviour Intervention Support implementation in U.S. high schools. It outlines some strategies schools have used. The authors argue that using student voice increases buy-in and this in turn leads to greater adoption and sustaining of interventions. The larger size of high schools compared to younger age settings is given as a barrier to student communication and collaboration. However, evidence suggests high school students seek more peer interaction in relation to their school environment and decision-making power. Greater ownership is seen when decisions are student initiated but systems are in place to share them with school staff. The report gives the example of having a student team who meet to ways to increase student engagement.

Miedijensky and Abramovich (2019) conducted a mixed-methods study to identify the actions and stages used when three elementary schools implemented education for sustainability. The schools formed a Green Council including students and a science teacher. However, this was not sufficient for sustaining the intervention in two of the schools. In the school that sustained the intervention activities suggested by the Green Council were regular and longer-term compared to one-time events in the other two schools.

Davis and Cooke (1998) reported an action research project about how a parent association group had supported the redevelopment of a playground at an Australian primary school. The project demonstrated how everyone in a school community can take part in planning and how this generates buy-in. Dynamic partnerships between pupils, parents, and teachers helped the adoption of the project and see changes made in the school environment. Communication of plans for consultation was achieved in multiple ways: surveys, newsletters, and providing contact details of committee members for feedback. The project relied on families and teachers giving up their time for planning and developing the playground.

Smith and Engelsen (2013) interviewed two school principals from Norwegian schools that had participated in a three-year project aimed at establishing an assessment for learning culture. This study provides evidence that involving pupils in an intervention does not necessarily increase intervention outcomes as rated by pupils. Principals argued that from being an active part of the intervention and understanding its purpose, pupil expectations in relation to assessment had been raised and as pupils knew more about formative assessment they had become more critical of teachers' practice.

What does our realist review show are relevant contexts and mechanisms?

The mechanism of *engaging* underpins efforts to involve and engage students, family members, and other staff across implementation whether earlier, here in relation to informing these key stakeholders, or later in using their feedback about a new approach as part of monitoring impact. Involvement needs to be meaningful, and this shows the value of any communication to, and feedback sought from, these stakeholders impacted by implementation both engaging their voice and their interest. The programme theory shows that there needs to be an *enabling structure* for student and parent engagement, both a system of communication that will keep those impacted by change informed and also a system that allows for data to be collected that can then be acted upon. Establishing the systems for student and parent engagement, means that student and family voice can be *engaged* in implementation. Through this staff, parents and or pupils may become *agents for change* due to their own increased buy-in, although this is more likely when involvement occurs with a group over time, like in the case of student action groups. Leaders and implementation teams play a role in ensuring staff, parents and students are sufficiently empowered to be authentically and meaningfully involved. In this way we can see a mechanism of *uniting* values around understanding implementation and intervention. Aspects such as the process of involvement, participation, and engagement of stakeholders are important. It is not simply about gathering and creating space for voices to be heard, but rather how these voices are *engaged* with and the quality of discourse that the conversations generate. The *intervention features* will also provide a context for involvement as the fit of the intervention with the experience of students and family will amplify the need for, and amount of, involvement. Data collected from families and students, alongside other data will enable *reflection* upon views and shaping further action.

Our realist synthesis indicated the interaction of enabling structures and uniting impacting acceptability, buy-in, and sustainability as indicated in the ICAMO configuration below.

ICAMO configuration for involve stakeholders

When attempting to change the behaviours of those in schools through the implementation of interventions, the programme theory context of *enabling structures* applies. As leadership and implementation teams are responsible and accountable for implementations, they will need to consider the structures and processes that unite all those for whom the intervention is relevant. *Engaging pupils, families, or other staff across the implementation effort should take place to unite values around the intervention implementation. The engagement should provide explanations of the programme, school mission, and their expected student or family behaviours. In addition, ask for and respond to their feedback authentically. This process supports the acceptability and buy-in from important stakeholders. Continued involvement and evidence of this shaping implementation of the intervention activity can help to sustain the intervention too.*

Implementation strategy 57: Involve Students, Family Members, and Other Staff.				
Engage or include students, families, and other staff in the implementation effort who may not directly be involved in delivering the new practice but are associated with it.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures - setting up the structure and process that allows for ongoing agentic engagement for staff, parents, and or students.	Leadership and implementation teams.	Engaging leading to Uniting – engaging voices in meaningful and empowering ways helps to align stakeholders toward the intervention and positively orientate others.	Acceptability, buy-in, fidelity.	Chambers et al., 2020; Frigge et al., 2019; Burriss and Ring, 2009; Samdal and Rowling, 2011; Weist et al., 2019; Grossi et al., 2019; Savage et al., 2011; Sadaji, 2021; Van Kuijk et al., 2021; Williams et al., 2021; Humphrey et al., 2020.
CERQual confidence rating: Low				

Summary

Some evidence, including reviews and mixed-methods evaluations relating to interventions implemented in schools, supports involving students and families in implementation in a meaningful way. It helps buy-in and acceptability when information about the intervention is shared and feedback is actioned. Therefore, this is not only about engaging stakeholders but about uniting understanding and acceptance of the intervention. We found significantly less evidence

about involving school staff not involved in delivering an intervention; the use of this strategy also varies according to how families are impacted and can support the intervention and whether there is scope for pupils to shape some of the intervention activities. Therefore, the coherence of the finding and adequacy of data represent some concerns meaning the ICAMO is rated as a low level of confidence. Although there was some evidence that meaningful involvement may be associated with fidelity, the outcomes tend to be more focused on adoption and buy-in rather than focused on the extent to which the intervention is put in place.

60. Access new funding

SISTER Strategy 60, 'access new funding', is categorised by Cook et al. (2019) as 'use financial strategies'. It is described as accessing new or existing money to facilitate the intervention. A further strategy—64, Fund and Contract for New Practices—is also considered here given the overlap: the latter refers to local, regional, and national authorities and government departments funding new approaches in schools.

To what extent does the evidence indicate outcomes?

There is evidence that accessing funding operates as a facilitator to increase adoption and sustainability as implementation outcomes. There is a lack of evidence that indicates the impact of funding on other outcomes such as fidelity and pupil outcomes. There is also comparatively little quantitative evidence that indicates the impact of different levels of funding. Evidence also suggests that accessing new funding may be necessary for adoption of a new approach but is unlikely to be sufficient as other implementation strategies will be utilised and clear understanding of how the funding will be used needs to be shared.

A range of evidence shows that accessing new funding is identified as an important facilitator for implementation and can support outcomes at different phases of implementation. In relation to a school-based physical activity implementation, Austin et al. (2011) sought to identify barriers and facilitators to adoption. They quote a principal who stated that they would not have been able to adopt the new approach without the funding for equipment and professional development. This study also indicated how funding alone would not be sufficient for adopting a new approach as the feasibility of implementing it and its fit with the existing school context was considered important too. Similarly, in a study evaluating a professional development programme for school physical activity, the availability of funds to provide training increased teacher attendance at the workshop (Carson et al., 2020). However, these authors noted that attendance at professional development did not translate into programme adoption for all teachers.

Blaine et al. (2017) used mixed-methods to investigate implementation outcomes for a childhood obesity prevention intervention in a low-income U.S. school district. Grant funding was used to maximise teacher attendance at afterschool training. These authors concluded that the financial support for attending training increased attendance at training and sustainability of the intervention. Similarly, Evans et al. (2015) completed a process evaluation to explain the adoption, delivery, and discontinuation of the Student Assistance Programme, a social-emotional learning programme across four Welsh schools. They found that intervention financial incentives from the local authority were used for training and resources which were viewed by senior managers as important to its adoption, particularly at a time when these schools were experiencing reduced budgets. However, here there was less clear impact on sustainability as one funded three-day training programme did not give teachers confidence to deliver the programme and ongoing training was felt to be needed.

Thomas et al. (2016) completed a process evaluation of interventions to encourage consumption of fruit, vegetables, and milk in middle school cafeterias. Funding had more of an impact on reach than expected because of the introduction of universal free school lunches at the time of the study. This indicates how national funding can be used to support specific interventions that fit a broad need.

Conversely, the lack of funding is an important barrier to implementation (Lyons and Brun 2019; Hung et al., 2014). There is also evidence that when initial funding is withdrawn it is likely that programmes will not be sustained (Dyssegaard et al., 2017). In a systematic review of health promotion programmes, Hung et al. (2014) found that a lack of financial support—both to compensate overtime work by health promoters in school and to fund ongoing professional development—was considered the largest barrier to sustaining such programmes by staff.

In summary, two reviews, four mixed-methods studies, and one qualitative study demonstrate some beneficial impact of accessing funding on outcomes that include adoption and sustainability. The evidence reviewed also suggests that a lack of funding negatively impacts on these outcomes.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence suggests that schools will often use funding for a new approach to fund resources, professional development, and support from experts (Arnold et al., 2021; Distel et al., 2019; Moore et al., 2021). Therefore, this strategy is used in combination with others.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies. They rated 'access new funding' and 'fund and contract for new practices' as important strategies, but not feasible for schools. How schools use this implementation strategy and the suggestion that accessing new funding may not always be possible indicates the importance of considering funding during the 'explore' phase alongside selecting an approach. We found little evidence here or in relation to other strategies about cost as an implementation outcome. There is an implication that schools need to think about the cost-effectiveness of a new approach, considering both the promise that an approach holds for improving outcomes in their setting and the level of cost and availability of funding to be able to introduce and sustain it.

What does the evidence tell us about how the strategy works well?

There is evidence that accessing new funding can improve adoption and sustainability when the funding itself is sustainable or there are plans for how to fund further professional development over time (Evans et al., 2015). Other evidence suggests the importance of sharing detail of the funding that is available as this can be used to both increase buy-in to new knowledge and resources that can be used to improve practice and will let staff know what support is available and can be requested.

When funding contracts are developed, evidence suggests the importance of considering the views of those individuals who will have their activity funded to make sure there is buy-in. Schelvis et al. (2016) conducted a qualitative study of a school occupational health intervention. They showed that although there was funding to provide support from staff representatives who could support this type of intervention, this was rarely taken up because school staff implementing the programme did not know this was a funded activity and the management contract that provided funding for the intervention was not shared. Similarly, the EEF's evaluation of the work of Research Schools in opportunity areas noted how funding has to be clear in what it is designated for, how it aligns with funders goals, and made transparent to those involved (Gu et al., 2021). Contractually, Research Schools were accountable to the EEF alone but accessing the Opportunity Areas funding meant there were opportunities and accountability to work with schools in that area. Some Research Schools reported pressure to respond to different demands and interpretation of how funding should be used.

Moore et al. (2021) report the range of implementation strategies that were used in a trauma-informed prevention programme in 29 schools. They report the use of 'access new funding' as an implementation strategy. The funding related to two research grants which covered the costs of programme implementation. This points to the challenge in drawing implications from research studies evaluating implementation of interventions as they often include funding for the intervention, meaning a lack of research that considers how schools access funding themselves or make decisions about how to use existing funding.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is highly relevant to accessing new funding because resources including funding and external support are an example of enabling structures that can provide schools with the conditions conducive to implementing a particular new approach or to prioritise addressing a particular need. Funding can relate to both internal and external systems (An et al., 2021; Gu et al., 2021). Intervention features are also relevant as the availability of resources and professional development and their cost will make obtaining funding more or less relevant. In principle the strategy of accessing new funding is in itself an enabling structure. However, considering the programme theory mechanism of *uniting* is relevant to both consider what funding ought to target and how the use of funding can be communicated in a way to encourage buy-in towards a new approach.

Our realist synthesis indicated the interaction of enabling structures and uniting impacting adoption and sustainability as indicated in the ICAMO configuration below.

ICAMO configuration for access new funding

When considering the need for new funding or reallocation of existing funding, schools will wish to consider the programme theory context of enabling structures. Our analysis suggests that acquiring funding that can access potentially costly aspects of implementation such as intervention resources, professional development, and expert support can be a key facilitator and increase adoption and sustainability. The programme theory also helps to consider how funding may help to put in place a structure that can support the intervention over the long-term even when funding is only available in the short-term. Leadership and implementation team members will be best placed to access relevant funding. Implementation team members may be best placed to organise funding to address needs to adopt the intervention and initially consider funding and therefore cost-effectiveness when appraising potential approaches. Funding that is used to access resources and skills that will help to deliver an approach as intended can help unite views and values about a new approach. Resources and professional development made accessible to staff can itself unite understanding and practices around a new approach. The availability of funding that can be used to support implementers with some flexibility can also help to generate buy-in towards the new approach. This leads implementing staff to greater intervention adoption; while continued funding or careful use of initial funding to develop an enabling infrastructure for resources and professional development can help the intervention be sustained.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 60: Access new funding				
Accessing new or existing money to facilitate the intervention.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures – Funding is used to provide resources that allow the new approach to be delivered as intended, including equipment and professional development.	School leaders and implementation team members identify funding and its use	Uniting via the use of funding that will often develop expert knowledge and understanding of the intervention. Funding can also improve views about the intervention.	Adoption, buy-in, sustainability.	Austin et al., 2011; Carson et al., 2020; Blaine et al., 2017; Dyssegaard, 2017; Evans et al., 2015; Thomas et al., 2016; Hung et al., 2014; Lyon et al., 2019; Arnold et al., 2021; Distel et al., 2019; Moore et al., 2021; An et al., 2021; Schelvis et al., 2016; Gu et al., 2021.
CERQual confidence rating: Low				

Summary

There is clear evidence that accessing funding may act as a facilitator to adopting a new approach and a barrier to adopting and sustaining an approach if needed funding is not available. There is a lack of evidence that indicates the impact of funding on other outcomes such as fidelity and pupil outcomes. There is also comparatively little quantitative evidence that indicates the impact of different levels of funding. Evidence also suggests that accessing new funding may be necessary for adoption of a new approach but is unlikely to be sufficient as other implementation strategies will be utilised and clear understanding of how the funding will be used needs to be shared. There is little evidence to suggest that funding can work as an implementation strategy in isolation as other strategies are indicated by common uses of funding such as acquiring intervention resources, professional development, and expert support.

Our realist synthesis shows how funding can be an enabling structure, yet the careful consideration of how funding can be used to sustain an approach shows how this structure can be made more enabling. Funding can be used to access skills and resources that unite views and values about the benefits of a new approach. The ICAMO configuration is rated as a low level of confidence. This is mainly in relation to adequacy of evidence contributing to the review finding. The importance of this strategy is established yet little evidence provides insights about how to acquire and use funding. There was also a lack of evidence considering how availability of funding might be considered as part of decision-making about which approach to select to address a recognised need that both fits the school setting and is feasible.

18. Test-drive and select practices

Definitions in the literature

The SISTER strategies define ‘test-driving and selecting practices’ as supporting school personnel to ‘try out various practices in small doses and have them choose/select the one they find most acceptable and appropriate’ (Cook et al., 2019 p. 922). Furthermore, Cook et al. outline the reasoning for the strategy being brought into the SISTER compilation due to incorporating choice and preference in the selection of an evidence-based practice showing promise in improving fidelity among educators who may initially be resistant. This indicates how this strategy might be relevant across phases of implementation as it involves delivery but can be an opportunity to explore intervention options too. We have not analysed 27, Identify Early Adopters, separately as this appears very similar, although more focused on who would test-drive.

To what extent does the evidence indicate outcomes?

Only small scale studies indicate the impact of test-driving practices on implementation outcomes such as penetration, fidelity, and sustaining. The majority of evidence related to piloting aspects of an intervention that were then used

extensively if this test-driving was deemed successful. It was rare for evidence to consider piloting different interventions that then led to a decision about what to adopt.

Durand et al. (2016), in a multiple case study examining school district leaders' orientations and strategies associated with state-mandated implementation of the Common Core State Standards, found that in high-implementing schools, leaders employed 'bridging, brokering, and buffering strategies to craft coherence and facilitate organizational learning and improvement' (p.46). This including taking a staged approach to implementation, where smaller elements of practice were delivered and evaluated to inform subsequent practice related decisions. This approach to leadership was proactive and adaptive and linked to higher levels of implementation penetration over time.

Smith and Engelsen (2013) interviewed two school principals from Norwegian schools that had participated in a three-year project aimed at establishing an assessment for learning culture. This study provides evidence that there is a need to deal with one criteria at a time, meaning that rather than create an assessment for learning culture in a very prescribed way involving all 13 criteria, principals recommended trying criteria step by step. Through discussion and reflection it is argued that school staff develop a sense of ownership and depth of learning about an aspect of the intervention, which was more manageable and impactful than trying to implement everything at once.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. School staff were supported to try out various intervention activities in small doses and then select those found most appropriate and acceptable. The study also placed this strategy as happening as part of the delivery of the intervention and related it to acceptability outcomes as anticipated, but also fidelity and sustainability. It is worth considering that the components of an intervention that are considered acceptable may not always be those that lead to improved pupil outcomes and this should be considered when piloting interventions.

Similarly, Gunderson et al. (2021) report that teams chose the order of implementing, and how to implement, the intervention's evidence-informed practices to reduce suicidality among LGBTQ high school students. They conducted qualitative interviews with school staff implementing these interventions to identify SISTER implementation strategies that were used. Some school teams also collected bespoke data in relation to elements of intervention they were test-driving including perceptions in advance.

However, when Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services, participants considered test-driving and selecting practices as neither particularly important or feasible as a SISTER strategy.

In summary, one quantitative study, one mixed-methods study, and three qualitative studies demonstrate some beneficial impact of test-driving new approaches on outcomes that include penetration, fidelity, and sustainability. The typically small-scale evidence reviewed suggests beneficial outcomes when test-driving informs what components of an intervention to select or how to adapt them for the school setting. Little evidence focuses on how piloting informs decision-making about which intervention to adopt.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence suggests that schools may benefit from test driving elements of practice when implementing approaches which navigate sensitive subjects such as behavioural expectations and social skills, which can be influenced by social and cultural differences as well as by issues relating to inequalities. This is in part due to the need to engage with the needs and perspective of the school community for implementation to not serve to further alienate certain pupils or families. Savage et al. (2011) contend that in these situations 'considerable time and attention should be given to authentic consultation that includes the community and focuses on student opportunity and responsibility' (p. 35). Authentic consultation is needed which aims to develop reciprocity between implementers and the wider community, facilitate opportunity for greater balance between speaking and listening, and aims to understand the perspectives of others to select and develop responsive and sensitive implementation practices.

What does the evidence tell us about how the strategy works well?

Evidence proposes that test driving practices to select appropriate and feasible options is linked with a school's capacity and capability to track progress using quality data management systems. In a qualitative study (n=11 participants) which examined the implementation of a School Wide Positive Behaviour Support programme in schools in New Zealand, evidence-based decision-making, which drew on learning generating through cascading the approach slowly over time, was linked with greater penetration, buy-in, and sustainability (Savage et al., 2011).

An evaluative study of 16 schools in the Netherlands suggests that cascading implementation practices and data-use are connected, and are a way to 'inform teachers about student's needs, allowing them to adapt and adjust instruction based on the input' (van Geel et al., 2017, p. 443). This reinforces the need for test driving and selecting practices to occur within quality data management systems which support efforts to disseminate practice, as well as helping to gather wide range of perspectives and experiences in which to sense check the relevance of practices against the needs of the community.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Evidence contends that there are several factors that enhance or hinder the impact of test-driving and selecting practices. The implementation drivers framework (Charlton et al., 2020), for example, proposes three main drivers of implementation which may be relevant: these correspond to issues around competency, organization, and leadership. In relation to competency, developing effective training and enabling the time and opportunity for implementers to access and engage is an integral part of building implementer capability to test drive and select effective practices. This evidence and that above suggests the need to support those test-driving interventions with data collection tools and professional development in relation to the intervention. It is not surprising that Smith and Engelsen (2013) cited above noted the importance of protecting time if teachers were to deliver a component of the intervention in their classrooms and then reflect on this as part of professional learning that would help sustain an intervention. This may suggest why the strategy is not considered that feasible.

In an exploratory study which examined the use of the Comprehensive Implementation Training and Support (CITAS) model in the U.S. school context, Goldenthal et al. (2021) found that providing implementers with coaching appears to play a role in building capabilities around test-driving and selecting effective practices. The conversational, regular, and flexible format of coaching can provide the necessary ongoing support to implementers to reflect and disseminate practice in ways that can help them to adjust and adapt in response to pupil needs and outcomes.

What does our realist review show are relevant contexts and mechanisms?

The evidence holds relevance to our programme theory constructs. Our analysis suggests that test-driving and selecting practices can be used as a vehicle to drive progress forward (in coherence with the goals of an *intervention*) and as a vehicle to slow down (and anchor decision-making based on effective practice) (Goldstein et al., 2015; Hall, 2013; Reezigt and Creemers, 2005). When grounded in dissemination practices, experiences, and outcomes, test-driving smaller scale practice helps to *engage* implementers and support *reflection* (Savage et al., 2011; Tunks and Weller, 2009).

Agents for change, including implementation leaders, play an instrumental role in creating the *enabling structures* in which to facilitate ongoing *engagement* with choice about intervention delivery and data informing this. This is required to understand which elements of practice should be focused on, at which times, and what the outcomes of these decisions are for implementation and pupil outcomes (Durand et al., 2016; Robinson and Gray, 2019; Gale et al., 2020). Early adopters who test-drive practices are key agents for change, empowered to help select the right practice for their school (Campbell and Lassiter, 2020). In *enabling structures*, *agents for change* are empowered to *unite* and cohere around a general understanding of how data can inform practice for the good (Frigge et al., 2019) as well as a specific understanding of the best ways in which to approach a particular *intervention* and its ongoing assessment (van Geel et al., 2017; Icel, 2018). We found more evidence about piloting that helps to unite values about the purpose and potential of an intervention driving outcomes, rather than reflection about whether an intervention should be selected or decision-making about which intervention components to use.

Our realist synthesis indicated the interaction of both enabling structures and agents for change as contexts with uniting impacting penetration and fidelity as indicated in the ICAMO configuration below.

ICAMO configuration for test-drive practices

If agents for change, especially within a leadership role, understand data as a continual development tool not just an accountability tool then they can share this understanding with their wider implementation team as well as using this understanding to guide the creation and maintenance of enabling structures which give staff the time and space to use data effectively to test-drive and inform the selection of implementation practices. When structures created to support implementation incorporate and unite multiple feedback systems this can help to generate self-regulative learning around how data can inform next steps. Evidence about the impact of the approach that has been piloted then helps to unite values around this intervention as it has been robustly trialled and evaluated. When there is careful selection of an intervention, informed by data collected during piloting, there is likely to be greater penetration of the intervention and fidelity and sustainability seen as the intervention has increased potential for success.

Implementation strategy 18: Test-drive and select practices

Pilot new practices and test-drive their effectiveness to inform subsequent directions in practice.

Context	Actor	Mechanism	Outcome	Evidence

Agents for change/enabling structures: Agents for change facilitate the conditions where data is viewed and used as a continual development tool which guides test driving and the selection of implementation practices.	School leaders/ implementation leaders.	Uniting understanding and action can generate insights which inform the next steps of implementation. Understanding needs to be developed around the uses of data linked to practice and this needs to inform actions in relation to test-driving.	Helps implementation teams to link and build a greater depth of understanding around what works and why and use this to inform decision-making. Fidelity Penetration Sustainability	Reezigt and Creemers, 2005; Tunks and Weller, 2009; Savage et al., 2011; Hall, 2013; Goldstein et al., 2015; Durand et al., 2016; Leeman et al., 2018; Icel, 2018; van Geel et al., 2017; Frigge et al., 2019; Robinson and Gray, 2019; Gale et al., 2020.
CERQual confidence rating: Low				

Summary

There is evidence that test-driving and selecting practices is a useful strategy in isolation or in line with other related strategies such as SISTER strategy 10, Stage Implementation Scale-Up. Our realist analysis shows that agents for change acting in enabling structures can unite early implementers around the role of data in informing decision-making around test-driving and selecting suitable practices. The ICAMO configuration for test-driving and selecting practices is rated with a lower level of confidence, there are concerns about the methodological limitations of the evidence about test-driving approaches and adequacy of the evidence about the strategy.

68. Change/alter environment

SISTER Strategy 68, 'change/alter environment', is categorised by Cook et al. (2019) as a way to change infrastructure. It is described as 'evaluate current environment and, as needed, alter or change aspects of it (e.g., changing the layout of a classroom, master scheduling, repurposing space) to best accommodate new practices'. We considered SISTER strategy 69, Change School or Community Sites, as being very similar and therefore is considered here, although this other strategy specifies a change in location rather than changing the existing environment.

To what extent does the evidence indicate outcomes?

Research studies often consider how both time and the physical environment of a school setting are barriers to implementation. Time is relevant to the strategy as a way of altering the environment is through scheduling and timetabling to actively make time for the new intervention, particularly when it is classroom based.

In an exploratory case study to understand how teachers, working with English Language Learners expanded their knowledge and instructional practices as they implemented a one to one iPad programme challenges were found (Prince, 2018). In this shift to a one to one environment hardware as well as software challenges such as variability in access to hardware such as Apple TVs, interactive whiteboards, and projectors were experienced. Another challenge was supporting the technology investment. Not everyone felt the additional money should have been spent purchasing, maintaining, and upgrading the iPads. This shows how some schools may have existing environments and technology that are more conducive to some new approaches, while there also may be resistance to changing the environment.

A study on the implementation of small learning communities by Temple University College of Education (2010) found it important to schedule common planning time and to protect it. Teachers were frustrated to have to leave their common planning time for professional development (which they considered either irrelevant or redundant) or having to use the time for other meetings. Another challenge to protecting teacher time was competing reforms which prevented the much valued observations of other teachers' classrooms from taking place. Lastly, the study found that space can impact implementation. Team identity and a sense of community are supported by implementing staff working in proximity to each other. This study shows that the environment for implementation including how conducive it is for collaboration is important as well as the environment for the new approach.

In an evaluation of a Healthy School Communities (HSC) pilot project, Valois et al. (2014) highlight that a healthy school environment provides the structure and foundation for a variety of improved student outcomes. Sites at which the HSC work was undertaken within the context of the school improvement process were likely to engage in more meaningful and integrated planning than sites that did not. Assessment of the school health environment was required as part of the intervention which supported fidelity and adherence to the intervention. Although the assessment of the school

environment was part of the intervention in this example, it does show how the extent to which this is done can impact on implementation outcomes.

Obtaining the right space for interventions in school settings was reported to be a barrier in a number of studies. Holliday et al. (2009) highlighted that inappropriate spaces limited the fidelity of the health-promoting intervention sessions evaluated in their study. The importance of having a dedicated space for a language skills development was evidenced as a facilitator in Dimova et al. (2020). In physical activity interventions that extend beyond curriculum based physical education, spaces where there were no distractions or had to share with other classes were found to be barriers to implementation (Meixner et al., 2019; Taylor et al., 2018).

The importance of protecting time was one of the findings in Merle et al. (2022). In their meta-analysis examining the types and magnitude of effect of implementation strategies that have been designed and tested to improve teacher adherence to social emotional and behavioural they found modifying interventions to fit the school context, such as changing the social environment or providing protected time for planning and teaming benefits adoption and fidelity.

In a study of the predictors of, and the barriers to, the adoption of school-based vegetable and fruit programmes, Nathan et al. (2010) found that broad environmental factors and supporting school empowerment maximised adoption of the programme which led to health benefits for children. Principals participating in the study reported limited time in the curriculum as the most common barrier. Over 40% of principals referred to an already crowded curriculum meaning education around fruit and vegetables as part of the programmes was found difficult to implement in classrooms. In their study on the Promoting Alternative Thinking Strategies (PATHS) curriculum, Humphrey et al. (2018) demonstrate that when sufficient time is not provided fidelity will suffer as components of interventions may be left out. They also found that professional development could help to support this fidelity.

Securing and protecting time were also important concerns raised in Connors et al. (2022). They explored stakeholder perceptions of the most feasible and important implementation strategies to increase mental health providers' use of measurement-based care (MBC) in schools. They found limited time should be acknowledged, and supported with time for self-reflection and personalised action planning, perhaps with leadership involvement. For the measurement-based care intervention time was secured and protected for individualised implementation planning to work out how to integrate it into existing workflows, anticipate barriers and prepare solutions. In addition, to promote buy-in and adoption the study recommended usable implementation plans including timeframes and milestones be developed around student outcomes as the ultimate goal of the MBC implementation effort.

These findings are supported by Gunderson et al. (2021) in their study of school-based strategies resulting from the application of the dynamic adaptation process to reduce sexual and gender minority youth suicide. Also, in a study on the implementation strategies that were used during a school-based efficacy trial of a trauma-informed prevention programme Moore et al. (2021) reported that schools adjusted their scheduling and space, considering classroom layout and offering the intervention during breaks to accommodate programme delivery to participating 8th graders. Programme timing and classroom layout was also adjusted as needed in response to holidays and school activities. Alongside a range of other implementation strategies, participants reported impact on fidelity, acceptability, feasibility and adoption.

Finding time in the school schedule was also a barrier reported in Fagan et al. (2009). They described the strategies used by 12 community coalitions to collaborate with schools to select and implement school-based prevention programs. Finding room in the school schedule to teach curricula was a common barrier to adoption. Similar findings about new approaches needing to compete with other scheduled session on the curriculum were reported in a range of other studies—an early language intervention (Dimova et al., 2020), an approach to increase inclusion (Mulholland and O'Connor, 2016), school-based health promotion interventions (Holliday et al., 2009), social, personal, and health education (Gabhainn et al., 2010), classroom-based cognitive-behavioural therapy (Stallard et al., 2013), and physical activity (Weatherson et al., 2017).

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies, participants considered changing or altering the environment as both an important and feasible implementation strategy.

In summary, one review, one quantitative study, six mixed-methods studies, and five qualitative studies demonstrate some beneficial impact of changing and altering the school environment on outcomes that include fidelity, adherence and some student outcomes. The evidence reviewed suggests not changing the environment can limit fidelity and that time was considered a key element of how conducive the school environment is to implementation. Few of the studies indicate the impact of altering the environment and this is often indicated as part of the intervention rather than a separate implementation strategy.

What does the evidence tell us about the situations in which schools might use this strategy?

There is evidence that changing or altering the school environment has been used beneficially in research that focuses on interventions that need additional timetabled sessions or to be incorporated within existing sessions. It is also evident that certain approaches that might need a specific environment like physical education or specific resources for tailored

support for literacy. Finally, when an intervention occurs outside of existing timetabled sessions schools can also be challenged to find both the time and space for the intervention alongside other activities. Overall, the situations are often indicated by the kind of approach being implemented. However, it is important to view the evidence about making changes to school environment and scheduling alongside evidence for the strategy 16, Promoting Adaptability. Schools will need to carefully weigh up whether it is important to adapt the environment in order that an approach can be delivered with fidelity or if adaptations to the approach can be made to help it fit existing school structures. For instance, O'Hare et al. (2018) reported that reducing the dose of Positive Action, a social and emotional learning intervention could improve fidelity because teachers were more able to fit it alongside other curriculum demands.

What does the evidence tell us about how the strategy works well?

Hudson et al. (2020) conducted a qualitative interview study with key staff involved in implementation of whole-school mindfulness approaches in five schools. Participants reported that often only school leaders that can make the necessary adjustments to timetables that can help the programme be delivered with fidelity. This finding is supported by Sadjadi et al. (2021) in a systematic review of bullying prevention interventions and Buston et al. (2002) who evaluated a sex education programme.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms of *enabling structures*, *intervention features*, and *reflection* hold relevance to decisions to change or alter school environments. Altering the environment or scheduling to provide the conditions for a new approach to be adopted is itself an *enabling structure*. However, our analysis identified that *intervention features* will determine whether there is a need to make any changes to school schedules or environments and therefore the key consideration is how well the new approach fits with the existing school practices. Considering the core components of the new approach is also key as this can help determine whether the school environment may need to be adapted (to allow core components to be delivered) or the approach can be adapted to fit the school setting (but still retaining core components).

Reflecting on the fit and feasibility of an intervention is key for carefully considering any alterations to the school environment. This may involve reflecting on barriers and facilitators for the intervention (Hudson et al., 2020) both identified from evaluating the approach when it is explored and by reflecting over time. Reflection as a mechanism also involves critically considering what may need to be adapted about the school context versus the intervention so that it can fit and be sustained in the current school (McBride et al., 2002).

Our realist synthesis indicated the interaction of intervention features and reflection impacting adoption, fidelity, and sustaining the intervention as indicated in the ICAMO configuration below.

ICAMO configuration for change/alter environment

When preparing to implement an intervention, attention to the evidenced based core components of the intervention and its fit with the school setting can help staff to explore whether, and identify how, to make adjustments to the school environment. Leaders, both at school level and implementation leads, are key actors, as school leaders are most likely to be able to facilitate any changes to the setting or schedule. It is also important that intervention experts are involved so that the reflection on the needs of the intervention is considered in line with any possible changes to the school environment. Reflecting on data is key to ensuring that implementation resonates with the needs and priorities of the school context and that implementers can relate and respond to expectations in a feasible and accessible manner. Reflecting on the fit of the approach in the school setting when planning but also over time can help to make adjustments to systems and structures that help deliver the intervention with fidelity. Changing the environment can help implementers' attitudes towards the intervention and their perceived ability to put it into practice. Therefore, changing the environment to accommodate a new approach can improve adopting, as well as sustaining the intervention over time.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 68: Change/alter environment				
Evaluate current environment and, as needed, alter or change aspects of it (e.g., changing the layout of a classroom, master scheduling, repurposing space) to best accommodate new practices.				
C ontext	A ctor	M echanism	O utcome	E vidence

Intervention features: Data reviewed and intervention understood allowing attention to core components, fit with the school setting, and where necessary to change the school environment.	Implementation leads guiding where changes may be necessary. School leads to approve changes.	Reflecting: on the core components of an approach and its fit with the school setting can help ensure that the needs and priorities of both the approach and those implementing it are valued.	Adoption Fidelity Sustainability	Nathan 2010; Prince 2018; Florian 2000; Temple University College of Education, Valois 2014; Fagan 2009; Holliday et al., 2009; Dimova et al., 2020; Meixner et al., 2019; Merle et al., 2022; Taylor et al., 2018; Connors et al., 2022; O'Hare et al., 2018; Hudson et al., 2020.
CERQual confidence rating: Low				

Summary

There is evidence that changing or altering the school environment can be beneficial and linked to a range of implementation outcomes, with a small amount of evidence suggesting improved pupil outcomes. Adapting the school environment needs to be considered in relation to the adaptability of the intervention and fidelity to its core components. Changes to the environment can improve both adoption and fidelity. The relevance of this strategy varies greatly according to the type of intervention being considered. When the approach requires scheduling within the existing timetable and locating within the school day there is greater need to make changes to the school setting. Our realist analysis shows how attention to core components, and reflecting on the fit between the approach and the school setting, helps to make sure that approaches are feasible and will be adopted and sustained. The ICAMO configuration is rated at a low confidence level. Several studies and reviews indicate that fidelity can be improved when changes are made to the environment. However, there are minor concerns in relation to the adequacy and coherence of evidence for the finding because the changes to environment involve both physical adaptations and making time for the intervention and its implementation. It can be hard to distinguish when schools might be using this strategy to allocate time for an intervention on a schedule compared to removing other demands and practices as part of other strategies. The strategy also needs to be considered in relation to adaptability of the approach. At times a new approach may be more easily adapted to fit the school setting and still delivered with fidelity compared to making changes to school systems.

74. Pruning competing initiatives

SISTER Strategy 74, 'pruning competing initiatives', is categorised by Cook et al. (2019) as a strategy to change infrastructure. It is described as removing or reducing other practices to reduce the risk of implementation overload and enable school staff to focus their energy and effort on preparing for and delivering a new practice. This was one of very few strategies added to the prior ERIC taxonomy in the light of the importance of schools de-prioritising implementation activities to make room for new practices.

We have also considered evidence related to two other overlapping strategies in this synthesis: 62, Alter Student or School Personnel Obligations to Enhance Participation in or Delivery of New Practice, Respectively and 65, Make Implementation Easier by Removing Burdensome Documentation Tasks. Often the evidence points towards competing demands generally.

Definitions in the literature

Cook et al. (2019) expand on the description of the strategy to position it as strategic de-adoption practices aiming to reduce the potential for implementation overload. It was included as a strategy to encourage prioritisation of one focused new practice. Cook et al. therefore emphasise that the competing initiatives are not necessarily the previous practices that are likely to be de-implemented to be replaced with a new approach that has been selected to improve outcomes or because of its feasibility, fit and cost compared to the current practice. Other literature tends to assume that pruning competing initiatives does refer to the practice that the new approach is essentially competing with (Locke et al., 2014; Nadeem and Ringle, 2016). Cook et al. instead highlight that often schools are implementing multiple new approaches and need to focus on prioritising one of these, at the expense of others.

To what extent does the evidence indicate outcomes?

There is evidence that pruning competing initiatives can improve the adoption, fidelity, and sustainability of new approaches. There is relatively little evidence for the impact of pruning competing initiatives as a proactive implementation strategy. Research evidence about the act of de-implementing approaches, such as Nadeem and Ringle (2016) who report on the de-adoption of a trauma intervention in schools in one U.S. district, is rare. Walsh-Bailey et al.'s systematic review of TMFs for de-implementation did not locate any that were school specific. Whereas a range of

studies, including reviews, establish competing demands and implementation overload as a barrier to implementation, more evidence is needed about strategies that can address this.

Evidence shows the negative impact of not de-implementing current practice and therefore the increased risk that schools will revert to previous practice or the status quo when the implementation of a new approach invariably becomes challenging. Fixsen et al. (2005) highlight that fear of change, inertia, and investment in current practices can all be barriers to implementation and this implies that it is not only the mechanistic need to remove previous practice but to address school staff concerns about the transition from current to new practice. School staff can feel as though there are competing work priorities and additional responsibilities at a time when they are preparing for a new approach while still using an existing practice (Fixsen et al., 2005). Evidence suggests that staff considering existing and new approaches alongside each other and the perceived workload of changing practice can easily lead to de-adoption and returning to the status quo. For instance, examples of school mental health initiatives have not been implemented and schools have returned to current practice. Miller et al. (2011) found for a school-based CBT anxiety prevention programme staff interest and capacity was limited due to workload and Stallard et al. (2012) reported that competing activities and priorities prevented the amount of planning and lead-in time recommended for a classroom-based CBT programme: this was felt to make adopting the new programme unnecessarily challenging. This indicates how careful pruning of competing initiatives is likely to increase adoption and sustainability of the new approach.

Langley et al. (2010) present clearer evidence of the need to prune competing initiatives. In their qualitative study of factors that impact successful implementation of a Cognitive Behavioural Intervention for Trauma in Schools, they interviewed both clinicians who had implemented the programme and those who had not been able to. These non-implementers gave competing responsibilities as the most critical barrier which prevented adoption of the programme. This barrier was also perceived as the second most important barrier to clinicians who were able to implement the programme in schools too. Clinicians described their competing duties which impacted on the amount of time both to plan and to run the intervention. Time and staff support were mentioned as lacking to manage the competing responsibilities.

Allison et al. (2018) provide quantitative evidence of competing demands as a barrier. In a survey of administrators at U.S. schools, 77% perceived competing curriculum priorities as a barrier to daily physical activity. Those administrators and teachers that did not report this barrier reported higher fidelity of daily physical activity at both school and classroom level. This suggests that when competing demands have been relieved or are not perceived in this way fidelity increases. Of note, the study seems to suggest that it was the act of putting daily physical activity on the timetable that was the key to reducing the feeling of competing demands and increasing fidelity rather than necessarily reducing the amount to be covered on the curriculum.

Johnson et al. (2021) provide evidence of how a change of practice cannot be incorporated alongside existing practice without additional staff support. School nurses reported that competing demands was a primary barrier to implementation of an asthma telehealth programme. School nurses were typically seeing 50 to 75 children a day, often at short notice and therefore without a reduction in workload or additional staff support they reported implementing a new programme was too challenging.

Similarly, Locke et al. (2014) explored barriers to using a social engagement intervention for children with autism. Feasibility of implementing the approach was limited by the multiple and changing priorities school staff held during break and lunchtimes when the intervention was supposed to run. Prioritising competing demands was mentioned in 18% of the field notes made by school staff, as staff were responsible for a range of children, had cleaning duties. Again, when staff are expected to deliver a new approach while retaining existing responsibilities this is reported not to be feasible.

Moore et al. (2021) report the range of implementation strategies that were used in a trauma-informed prevention programme in 29 schools. School administrators made sure that students could attend sessions by altering their timetable and where possible advocated for staff not to have any additional responsibilities during programme sessions. Little further detail is given, potentially because this was a strategy used by schools rather than the research team. However, it is notable that when Lyon et al. (2019) evaluated the feasibility and importance of the SISTER strategies, school-based consultants considered this strategy to be important but not feasible. This reiterates the challenge of alleviating competing demands in school settings.

In summary, one review, two quantitative studies, four mixed-methods studies, and three qualitative studies demonstrate some beneficial impact of pruning competing initiatives on outcomes that include adoption, fidelity, and sustainability. The evidence reviewed suggests that it can be challenging to de-implement prior practices and some of the evidence located suggests the negative impact on implementation outcomes when de-implementation does not occur or that, more generally, there are competing demands for implementers' time.

What does the evidence tell us about the situations in which schools might use this strategy?

There is evidence of a need to identify and respond to competing demands when implementing a range of new approaches including mental health support and curriculum change. Further evidence show how schools may consider

the transition from current practice to a new approach and the aspects of implementation, such as professional development, which may be interpreted as competing for the limited time implementers often report.

A new approach will change the status quo. How this can be managed is evidenced by Salvaterra and Adams (1998) who interviewed school leaders in 12 U.S. high schools. The study focused on planning a structural change from a traditional schedule with 45-minute periods to 90-minute periods of a block schedule. The findings show, again, that pruning competing initiatives or making a change in an approach is less about the logistics of organising the change and about how to communicate the need and benefit of the change. School leaders emphasised that they communicated the need for change, focused on the improvement in pupil outcomes, and made clear that the status quo was not an option because of this shared understanding about needs. The new approach was positioned as a solution to addressing a problem rather than a competitor with the existing practice. Despite this, school leaders reported how staff experienced challenges in adopting the new approach. Resources and support to adopt the new approach were needed and were sought if they were not available. School leaders also became aware aspects of the previous approach staff missed, leading to a negative social impact. Here, block scheduling meant there were fewer opportunities for teachers to socialise.

Lawrence et al. (2011) show how the concept of pruning competing initiatives can relate to aspects of implementation rather than only different approaches being implemented as a whole. They surveyed and interviewed a range of school staff involved in implementing a programme to enhance Mathematics Teaching at High Schools. They found that the professional development teachers received would compete with other professional development initiatives and create confusion for teachers. Teachers found that even when the professional development is complementary or takes a different focus it is challenging to recall both and change practice in two different ways.

Often the competing demands reported in research as a barrier to implementation is associated with a lack of time for implementing a new approach as planned. Therefore, a range of research that shows lack of time as a barrier to adoption is relevant here. For instance, time was found to be a critical aspect in a systematic review of school based physical activity interventions (Naylor et al., 2015): a lack of time was found to be the most prevalent barrier to implementation (in 22 of the 29 included studies). Specifically, the amount of time teachers needed to prepare or deliver physical activity sessions was reported to be a significant barrier when teachers already perceived that they had high workload and competing instructional requirements.

Nadeem and Ringle (2016) show how pruning competing initiatives is not only a relevant implementation strategy when preparing to implement a new approach. The challenge of competing demands and potential new approaches which may lead to implementation overload are as relevant when seeking to sustain a new approach. They reported that one reason the school district de-implemented the cognitive behavioural trauma intervention was because therapists duties had changed over time and there was less opportunity for ad hoc counselling in school without a referral.

What does the evidence tell us about how the strategy works well?

There is evidence that pruning competing initiatives can focus on either reducing workload or providing additional support. Evidence previously discussed shows that pruning competing initiatives may involve both reducing other demands that might be seen as equally important and also prioritising the value of the new approach and implementation strategies that will help support its adoption.

Research studies cited thus far show that roles, responsibilities, and schedules of staff implementing a new approach need to be considered so they can be flexible enough to prepare for, and deliver, the new approach. In some situations the workload of current staff may be inadequate to support the change, so building internal capacity may ease staff burden, resolve scheduling conflicts, and, ultimately, help adopt a new approach rather than revert to existing practice (Locke et al., 2014).

In an evaluation of a programme of activities provided by four uniformed youth organisations, Gorard et al. (2016) found those school leaders who reviewed priorities with staff implementing the new approach, indicated the priority of the new programme, and considered capacity helped adoption of the programme. This suggests that alongside any changes to workload there is a need to emphasise the priority for a new programme.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

There is more research on barriers to sustaining a new approach over the longer term than barriers to reducing competing demands including other new approaches that might also be implemented in a school setting. It is worth noting again that this strategy was formulated in part to recognise the potential for implementation overload in schools (Cook et al., 2019). Therefore, a barrier to the use of this strategy, as well as a need for it, is the view that schools are implementing multiple new approaches and a challenge to sustaining interventions is the focus on multiple, newer initiatives rather than the active use of de-implementation as a strategy (DeWitt, 2022).

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to pruning competing initiatives because the new approach may be able to be built into school structures, such as appearing on the timetable and time as an enabling structure was often implied in the evidence that suggests the barrier of competing demands related to a lack of time for implementing staff (Naylor et al., 2015). However, the key contextual factor that drives the success of this strategy is the intervention features. The fit and feasibility of a new approach and the existing capacity to develop, deliver, and evaluate it will indicate the extent to which competing initiatives need to be de-implemented and, relatedly, the extent to which the benefits of the new approach over existing practice need to be emphasised (Locke et al., 2014). Pruning competing initiatives demonstrates the importance of the new approach to staff and their school and therefore can unite values around its benefit. Pruning competing initiatives can set the expectation that a school is moving away from current practice to address a recognised need (Salvaterra and Adams, 1998).

Our realist synthesis indicated the interaction of intervention features and uniting impacting adoption, buy-in, and sustainability as indicated in the ICAMO configuration below.

ICAMO configuration for pruning competing initiatives

When planning to adopt new approaches and sustain them, schools should consider how the programme theory context of intervention features sets conditions for pruning competing initiatives. This strategy is amplified when the intervention fit and feasibility is more challenging, perhaps because of staff workload in relation to the amount of preparation and changes to practice required. Equally, if the new approach is replacing current practice that is well established or may be easy to revert back to, tangible efforts to de-implement current practice will be important. Implementation leaders and teams will need to assess the new approach in terms of its demand, while school leaders may be best placed to review what may be competing demands for key staff and implementers. Either reducing competing demands or clearly de-implementing current practice can help unite views and values about a new approach as expected and meeting shared needs. This can be an ongoing strategy that is revisited as over time other competing initiatives may arise and the value of the new approach may need reiterating. Because competing demands may threaten implementation over time, this strategy can promote sustainability. In the shorter term, setting the priority for the new approach over current practice and addressing workload so that the new approach is feasible will increase buy-in and adoption.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 74: Pruning competing initiatives				
Taking away or reducing other implementation efforts to reduce implementation overload and enable school personnel to focus their energy and effort on delivering an identified programme or practice.				
Context	Actor	Mechanism	Outcome	Evidence
Intervention features: the fit, feasibility of, and capacity for, the new approach.	School leaders can reduce competing demands; implementation leaders and teams can consider de-implementation of existing practice.	Uniting views and values about the new approach as addressing a recognised need and being the expected practice moving forwards.	Adoption, buy-in, and sustainability.	Fixsen et al., 2005; Langley 2010; Stallard et al., 2012; Gorard 2016; Salvaterra 1998; Lawrence 2011; Naylor et al., 2015; Johnson et al., 2021; Crane et al., 2021; Locke et al., 2014; Allison et al., 2018.
CERQual confidence rating: Low				

Summary

There is a lack of evidence that pruning competing initiatives or reducing competing demands for school staff directly increases adoption and sustainability as implementation outcomes. However, a range of evidence suggests that not addressing competing demands is a significant barrier to implementation outcomes. Evidence tends to focus on broad

competing demands rather than a new approach versus current practice or potentially rival new approaches that compete for implementers' time and attention. This is despite calls for more focus in the literature on de-implementation. Competing work demands are a barrier to adoption, while some evidence showed that this can be a barrier over the longer-term and new approaches may not be sustained if further new approaches erode either the time spent or the value placed on the approach in question.

Our realist synthesis shows how a new approach needs to be appraised to consider the potential impact it will have on implementers. Reducing demands will increase capacity for delivering a new approach while also signifying that it is valued over existing practice. The ICAMO configuration is rated as a low level of confidence. This is mainly in relation to adequacy of evidence contributing to the review finding. The importance of this strategy is established, yet little evidence provides insights about how best to prune competing initiatives.

26. Identify and prepare champions

SISTER Strategy 26, 'identify and prepare champions', recommends that schools 'identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in a school or district' (Cook et al., p. 923). The strategy implies that there may be more than one champion and that these individuals would have a formalised role in implementation activities designed to get the intervention off the ground: these may be logistical, procedural activities as well as relational activities that overcome early resistance to adopting a new practice.

Definitions in the literature

Champions are sometimes responsible for *building partnerships to support implementation* in schools (Gunderson et al., 2021). Champions tend to have a prior interest and need to have knowledge and exposure to what they are championing, but this may be pre-existing or through early professional development or visits to other schools (Walker et al., 2022). Identifying a champion involves recognising an appropriate member of staff with enthusiasm and the relevant knowledge and skills to support and potentially lead implementation. Champions can be prepared by being given capacity and authority to take forward new interventions in their school (Lord et al., 2017). Other terms are used for school staff in positions that match the definition of 'champions'. Van Geel et al. (2017) refer to 'teacher leaders' as role models who support and encourage colleagues to also adopt interventions. Cane and Oland (2015) refers to 'coordinators' who have a clear role that gives credibility to make decisions as well as knowledge about the intervention to support colleagues.

To what extent does the evidence indicate outcomes?

There is evidence from a range of different study designs that champions can improve adoption and sustainability in particular. There is some isolated evidence about impact on reach and intervention outcomes. There is also some mixed evidence as to the strategy's impact on fidelity. Van Geel et al. (2017) evaluated how school characteristics were related to the combined assessment of fidelity, reach, and teaching performance after using a data-based decision-making intervention and sustaining the intervention after two years. Data-based decision-making here is a broad intervention that relates to systematically collecting and analysing data to guide decision-making. Champions in the form of teacher leaders who acted as role models for teaching colleagues and supported and encouraged the changes in practice were more likely to be found in schools with stronger scores on the combined implementation measure.

Leadbeater et al. (2012, cited in Baffsky et al., 2023) investigated the strategies that impacted adoption of an intervention for the prevention of peer victimisation in elementary schools. They found that having a programme champion motivated teachers to adopt the programme and this was through communicating the benefits of the intervention both theoretically and from pilot study results that champions had conducted. In this study, champions also supported teachers with preparing to introduce the programme and therefore helped to reduce workload.

Quintanilha et al. (2013) also evidenced impact on adoption in a case study design with three schools to identify factors associated with early adoption of nutrition guidelines in Canada. This supports the impact of identifying and using health champions on implementation outcomes in terms of adoption and successfully using the guidelines in regular practice. Individuals identified as health champions had not been formally hired but because of their personal motivation to improve students' eating habits they had accepted the responsibility of planning, organising, and helping others to adopt healthy eating strategies. There were multiple champions in each school and included teachers. Champions tended to have established roles in their school, were described as possessing analytical and intuitive skills, and had the respect of colleagues and volunteers working with the healthy eating strategies.

Walker et al. (2022) conducted a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. They concluded that having multiple champions was important for adoption and sustaining the physical activity approaches used. Multiple champions could share responsibilities, like motivating other staff and leading training, and improve programme visibility.

McLoughlin et al. (2022) evaluated a school wellness programme to assess implementation outcomes of adoption, fidelity, and penetration. Mixed-methods data collection from 52 U.S. schools took place. A wide range of implementation determinants were reported in the study. The use of a champion in schools was found to be positively associated with both fidelity and adoption outcomes at a statistically significant level, although this was not the case for penetration.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services; participants considered identifying and preparing champions as both an important and feasible SISTER strategy. Similarly, Connors et al. (2022) asked school mental health practitioners and researchers to rate the importance and feasibility of implementation strategies to increase school mental health providers use of measurement-based care (collection and use of student data throughout treatment). Six strategies were rated as particularly important and feasible; this included identifying and preparing champions.

Wilhelm et al. (2021) found mixed evidence in relation to champions' impact on fidelity. They identified and compared barriers and facilitators related to implementation of a multi-component urban public school participatory health intervention in a qualitative study employing an adaptation of the Consolidated Framework for Implementation Research (CFIR) to guide analysis. While the five participating schools were ranked by fidelity, champions were found to have mixed evidence across higher and lower fidelity schools.

In summary, one quantitative study, three mixed-methods studies, and three qualitative studies demonstrate beneficial impact of the use of champions on outcomes that include adoption, sustainability, reach, and intervention outcomes. There is also some mixed evidence as to the strategy's impact on fidelity, suggesting that champions on their own would not impact whether implementers are delivering a new approach as intended. There is mixed evidence as to whether one champion is sufficient and the type of staff who can act as a champion.

What does the evidence tell us about the situations in which schools might use this strategy?

The champion role can be both logistical in terms of sharing knowledge about the intervention and focused on engaging others in implementing the intervention (Leung et al., 2020). The champion may need to take initiative and determine actions they need to take over time, like communication to promote the intervention, reminding colleagues about key aspects of the intervention, and updating school leaders on progress and decision points. As such, champions may play a continued role, rather than be key only in the early stages of implementation (Ryan Jackson et al., 2018). That said, some of these actions are also typical for implementation teams, raising the idea that the number of champions may increase over time (Walker et al., 2022).

Ryan Jackson et al. (2018) wrote a framework for leading schools through rapid improvement. This indicates that leadership in relation to implementation changes over time, even if that timescale is rapid. Champions may be beneficial earlier, either as designated roles or as a style of leadership, to engage those who will be involved in implementation and generate buy-in. Later, more technical leadership may be needed to support the intervention to be put in place and sustained. Champions may therefore be relevant earlier in the implementation process.

What does the evidence tell us about how the strategy works well?

Champions need support from implementation leaders. This is both to generate enthusiasm in colleagues but also to play a part in decision-making about an intervention. Hudson et al. (2020) also evidence the relationship between champions and leadership. They conducted a qualitative interview study with key staff involved in implementation of whole-school mindfulness approaches in five schools. This study indicated the role of school leaders as having a key decision in determining who would be selected as a champion. Selecting the right person or people to focus on the intervention and help others is an impactful role with decision-making power. However, champions might not lead implementation and have sole responsibility as evidence from other schools supports co-creation of capacity and knowledge to implement an intervention across a school. The five participating schools were rated in terms of their fidelity of the programme. This suggested that schools where champions (referred to as 'internal implementation leaders') were selected by school leaders and had decision-making power had higher fidelity than schools that had champions that were not formally appointed in this way.

Cane and Oland (2015) report on focus groups conducted with schools that took part in the Targeting Mental Health in Schools (TaMHS) initiative in one English local authority. Champions in the form of intervention coordinators tended to be members of the school leadership team and this appeared to help confidence in championing the intervention and being able to offer advice and guidance to other colleagues. The authors raise the implication that champions would benefit from having a more clearly defined role expectation and support from school leaders to have confidence in the role and be able to support and encourage colleagues. Similarly, Humprey et al. (2020) report in their evaluation of Achievement for All that champions were more effective when they were members of the school leadership team.

Lane et al. (2022) analysed data collected from a mixed-methods trial of a physical activity intervention in Australian Primary Schools. The PACE intervention includes eight implementation strategies including identify a champion. Findings show how a champion's decision-making power and level of interest in an intervention are key factors for implementation outcomes such as adoption, dose, and fidelity. The champion was considered an important strategy by

other participants and measures of adoption were strong for all champions. However, only three quarters of teachers agreed they had support from the champion in their school.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. The paper reports that identification of champions was part of the use of the Dynamic Adaptation Process (DAP) to combine several implementation strategies. Researchers assumed that school nurses—in their role related to student health—would be appropriate champions or team leads but in nine schools this role was taken up by different roles, depending on local context and needs. In this study, champions constructed implementation teams and educated colleagues about the intervention encouraging them to buy-in. Similarly, in a mixed-methods evaluation of teacher attitudes towards a nutrition curriculum for middle school students, Probart et al. (1997) support the role of a champion leading teams and indicate that they have an active role in generating early enthusiasm. However, in this study part of the champion's role was to work with the team of teachers implementing the curriculum. This may suggest that a champion might work with delivery teams rather than only the implementation team who make decisions.

Lord et al. (2017) evaluated the EEF funded Evidence-Based Literacy Support, Literacy Octopus trial. The qualitative evaluation included observations of activities, interviews, and case studies. The authors conclude, based on the case studies conducted, that having a research champion to drive the change was key for schools. Where schools had made changes to their Key Stage 2 literacy provision or their use of research, research champions were found to facilitate this. It was found that these research champions or research leads cascaded information to other staff, facilitated staff meetings, and, where they were given authority, made key decisions to drive forward adopting a new intervention.

Champions, however, may need to share responsibility. Evans et al. (2015) completed a process evaluation to explain the adoption, delivery, and discontinuation of the Student Assistance Programme, a social-emotional learning programme across four Welsh schools. The findings indicate that over-reliance on a limited number of individuals (or just one champion) can negatively impact sustainability due to developing fatigue and negative thinking about the intervention and limited organisational capacity.

Likewise, Firth et al. (2008) report findings from a process evaluation of a three-year trial of an intervention to promote pupil mental health in 25 schools in Australia. They found that more successful schools did not leave most of the work to one or two people, suggesting that champions need to function within a supportive team to sustain an intervention in practice. This is facilitated by clearly defined roles and staff retention.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Crane et al. (2021) completed qualitative interviews with school staff introducing a computer-assisted intervention for anxious schoolchildren in U.S. elementary schools. Interviews were completed both after initial introduction of the intervention and in the second year to consider sustainability. Interviews were analysed using the Consolidated Framework for Implementation Research (CFIR) domains. Champions were identified across schools and held a variety of roles, including principals, teachers, school psychologists, and support staff. Champions supported implementation by promoting the programme, sharing the belief that it would be beneficial for students, and changing timetables to allow access to the programme. Something that facilitated champions were using relationships with other staff to work through barriers. On the other hand, staff turnover was a barrier in terms of sustainability when champions left the school.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *agents for change* is clearly relevant to champions as staff in this role are encouraging and supporting implementation for colleagues and therefore effective champions are agents for change. However, the other contexts are also relevant. *Intervention features* provide a context in terms of identifying champions. Who a champion is will be dependent on the intervention and champions may need to increase their skills or knowledge in relation to the intervention to fulfil the role. The mechanism of *uniting* is well evidenced as champions are often supporting other colleagues to adopt the intervention through selling the benefits of the intervention and supporting with any initial challenges or resistance. Therefore, champions are also *engaging* colleagues in relation to the benefits of the intervention.

Our realist synthesis indicated the interaction of agents for change and engaging other staff, which impacts adoption, fidelity, and sustainability of an intervention as indicated in the ICAMO configuration below.

ICAMO configuration for champions

Agents for change: senior leaders need to identify and prepare one or more individuals with capacity and motivation to drive early enthusiasm for the new intervention and to take on practical set-up tasks. They will be most effective if supported in a distributed leadership setting where some but not all responsibility sits with them. It is important that individuals are not overburdened with driving the implementation effort. Change should continue to be seen as a collective responsibility even when there is a champion of the intervention. Champions may be most effective when they represent senior leadership and therefore have authority, delegate, make resources available, and designate staff time,

so it depends on both who they are and logistical aspects of what they do. Senior leadership have responsibility for designating the champion. Champions are a key agent for change due to their practical knowledge of implementation processes and their strong communication skills. They therefore are engaging colleagues' interest and investment in an intervention. They also listen and communicate with key people involved in implementation to ensure that processes and procedures are working. Their formalised role gives them the ability to communicate with authority both up and down the school system. The champion is also responsible for generating enthusiasm through discourse with all groups necessary for implementation. Champions may be particularly effective in the early phases of implementation because they generate enthusiasm around the new approach, initiate the implementation process, and coordinate logistical aspects of the programme. Their positive attitude to change can facilitate wider adoption of the new practice and facilitate initiation of change. Through supporting colleagues and championing the intervention they can impact on fidelity and sustainability.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation strategy 26: Identify and Prepare Champions.				
Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in a school or district.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change (identify champion/s).	SLT (identifying and preparing) and champion.	Engaging (communicating up and down the school, engaging various perspective).	Adoption in particular, but also some evidence for fidelity, sustaining, and pupil outcomes.	Cane, 2015; Crane , 2021; Firth , 2008; Evans , 2015; Probart , 1997; Quintanilha, 2013; Humphrey , 2020.
CERQual confidence rating: Moderate				

Summary

A range of evidence shows the benefits of staff in a champion role in relation to adoption and sustaining implementation. In terms of engaging other colleagues this is particularly key for adoption. Champions need support in what may not always be a formalised role if individuals are not already an implementation leader. There is evidence that having one champion may be burdensome on the individual and risk impact on staff turnover; we also have a moderate level of confidence in relation to this ICAMO configuration. The rating is not higher because there are uncertainties as to how champions may work with other key actors like the implementation team and how many champions there ought to be impacting the coherence of this review finding. There was some mixed evidence about impact on fidelity giving minor concern about the adequacy of data too. Furthermore, champions tend to use other implementation strategies to have an impact on colleagues, suggesting the strategy in isolation may not be sufficient to impact outcomes.

28. Inform local opinion leaders

SISTER Strategy 28, 'inform local opinion leaders', suggests that schools inform staff who have been identified as opinion leaders or educationally influential about a new intervention as they may be able to socially influence colleagues to adopt it. Local opinion leaders may have an informal, relational role to play in encouraging positivity and openness to change among staff. The strategy may be particularly important in the early stages of implementation to build enthusiasm and encourage adoption.

Definitions in the literature

'Local opinion leaders' are leaders in schools with formal or informal roles that can influence the attitudes and beliefs of their colleagues in relation to implementation of new interventions (Asada et al., 2020). Opinion leaders promote the use of new interventions among colleagues (Wolfenden et al., 2017); they are seen as likeable, trustworthy, and influential. An influential feature is their interpersonal relationship and communications with a wide range of colleagues. They may use different methods to both educate colleagues and persuade them to buy-into a new intervention (Flodgren et al., 2019).

There are similarities between Strategy 26, 'identify and prepare champions', and this implementation strategy. It seems that opinion leaders are likely to take a less active role than if they were championing the intervention and therefore empowered to make decisions and support staff across implementation phases; opinion leaders are more likely to influence other staff to buy-into an intervention by sharing a positive view of the intervention (Atkins et al., 2008). Some authors distinguish 'champions' from 'opinion leaders' because champions are assumed to be asked to step into this role rather than being in such a position through their existing respect from colleagues (Flodgren et al., 2019).

To what extent does the evidence indicate outcomes?

There is evidence that local opinion leaders can improve acceptability and adoption implementation outcomes across several studies ranging from reviews to studies that focus on this strategy in isolation. There is some promise in relation to fidelity outcomes, which is perhaps surprising given the focus on increasing colleague buy-in. There is less evidence in relation to this strategy compared to others, although this does include some systematic review evidence. Pinning down who is an opinion leader is challenged by different definitions and this might explain some conflicting findings in relation to adoption.

Atkins et al. (2008) focused on this in their quantitative study that compared the diffusion or reach of evidence-based practices for ADHD in schools with key opinion leaders matched with schools that did not have teachers in this role and received mental health provider consultation only. The study was also reported to be the first to examine the impact of opinion leaders in low-income U.S. urban schools. Mixed effects regression models showed that teachers' self-reported use of strategies was higher in schools with teacher opinion leaders compared to matched schools over the course of two years and these higher ratings appeared to be due to opinion leader support rather than the mental health practitioner support also available in these schools.

Drmic et al. (2017) conducted a mixed-methods study primarily to evaluate the adaptation, feasibility and acceptability of a cognitive behavioural therapy intervention for pupils with autism in Singapore delivered by school staff. Across the 22 schools participating, a key school administrator was the opinion leader and was involved in all aspects of the project. The study reported that the administrator was able to garner support and interest from key stakeholders, which may have helped impact on promising acceptability, feasibility, and anxiety outcomes. Contrasting with other studies it was reported that the opinion leader had a role in later phases of implementation by sharing initial outcomes and impact of the intervention with others and therefore sustaining interest and motivation. However, this implementation strategy was used alongside others such as adapting the intervention for the particular school and cultural context, professional development, and inclusion of parents rather than having an impact in isolation.

Baffsky et al. (2023) systematically reviewed evidence to identify implementation strategies which improved fidelity and/or adoption of school-based mental health prevention programmes. The review used Cook et al.'s SISTER strategies as a basis for identifying implementation strategies in prior literature. On the basis of three qualitative studies, the review concluded that engaging principals as local opinion leaders was a promising strategy to enhance the adoption of programmes. These three studies (Freeman et al., 2014; Hudson et al., 2020; Lohrmann et al., 2008) did not directly refer to school leaders as opinion leaders but it was concluded that school leaders were fulfilling the key actions of local opinion leaders in other studies by promoting the interventions and motivating staff. Arguably, school leaders were going beyond opinion leaders mentioned in most other studies as they allocated resources and were highly involved in planning implementation (Baffsky et al., 2023). These studies were also considering a range of implementation strategies, rather than opinion leaders in isolation, unlike Atkins et al. (2008). The review does provide some evidence for the impact of opinion leaders on adoption and suggest that school leaders may fulfil this role.

McLoughlin et al. (2022) evaluated a school wellness programme to assess implementation outcomes of adoption, fidelity, penetration, and sustainment. Mixed-methods data collection from 52 U.S. schools took place. A wide range of implementation determinants were reported. The use of opinion leaders in schools was only found to be positively associated with fidelity at a statistically significant level; it did not appear to relate to penetration or adoption, which contrasts with other literature.

In summary, one review, one quantitative study, and two mixed-methods studies demonstrate some beneficial impact of using local opinion leaders on outcomes that include acceptability and adoption. There is some promise in relation to fidelity outcomes; however, a relatively small number of reviews and studies provide evidence on local opinion leaders compared to similar roles like champions.

What does the evidence tell us about how the strategy works well?

Chambers et al. (2020) examined the implementation of universal free school meals for children in the first three years of primary school in Scotland using a case study approach including observations over two years. The study does not refer to local opinion leaders but does find that key individuals are identified by school leaders ahead of the policy being put in place with a focus on developing relationships with other staff involved to encourage them to help the policy succeed. This suggests the relational aspect of the work of local opinion leaders.

Other studies suggest that school leaders can fulfil the role of local opinion leader. Asada et al. (2020) conducted a qualitative study with school leaders across the age range of U.S. schools who were their district's accountability figure

for school wellness policy implementation. In using the CFIR to guide analysis, opinion leaders as well as champions were considered. There were differences in the use of opinion leaders across districts. Notably this study suggests that these school leaders could be opinion leaders themselves providing recommendations to other schools and advocating wellness approaches and providing technical assistance to other school leaders as necessary.

This is supported by Wolfenden et al. (2017) who systematically reviewed the effectiveness of strategies aiming to improve the implementation of school-based interventions aiming to address health outcomes including diet, obesity, physical activity, smoking, and alcohol use. Overall, the review reported mixed findings about the impact of strategies on fidelity and reported risk of bias across included studies. Included studies used a range of implementation strategies and therefore did not isolate local opinion leaders. However, in comparing the range of fidelity outcomes in relation to trials that used local opinion leaders the review reported that fidelity was improved when local opinion leaders were school principals as opposed to other recruited opinion leaders.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Tomokawa et al. (2018) showed in their case study about school health policy implementation in Thailand that a barrier in relation to the impact of local opinion leaders is staff turnover. They evidence how the loss of a key opinion leader impacted both leadership and coordination of the policy. Likewise, there was a lack of consistency in strategy and priorities for school health activities when principals changed roles.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts of *intervention features* and *agents for change* are important contexts for local opinion leaders. The intervention determines whether there are likely to be staff who will 'stand up' for the intervention and its benefits. Opinion leaders are a key *agent for change* as they are engaging colleagues, seeking to improve attitudes and intention to implement amongst colleagues. Opinion leaders can help *unite values* in relation to the intervention, increasing buy-in across staff who are involved. They *engage* colleagues in relation to the intervention, communicating the value of the intervention and demonstrating their commitment to it; however, it is their work that improves attitudes and buy-in and therefore uniting values about the intervention that is evidenced as driving outcomes. Our realist synthesis indicated the interaction of agents for change and uniting impacting adoption and diffusion amongst some other outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for inform local opinion leaders

Opinion leaders are agents for change as they communicate positive beliefs about an intervention to colleagues and help develop commitment towards change from others. They can empower colleagues to try the intervention or share their concerns. Often opinion leaders will be exercising leadership skills and may be in this role outside of informal support for the intervention. The implementation team has a role in identifying opinion leaders and informing them about the new practice. Opinion leaders then have a role in socially influencing other colleagues. This strategy generates actions through discourse and conversations. Opinion leaders generate change by aligning beliefs and values in relation to an intervention. Opinion leaders aim to unite colleagues' values, commitment, and support towards an intervention. Opinion leaders can do this by modelling their own values and encouraging others. By sharing a positive attitude to the implementation of a new intervention in practice, opinion leaders generate buy-in and commitment among staff.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 28: Inform local opinion leaders				
Inform school personnel identified by colleagues as opinion leaders or 'educationally influential' about the new practices who can socially influence colleagues to adopt it.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change (empowering individuals, dynamic leadership).	Opinion leader, implementation team.	Uniting (discourse and actions are generated by conversations, colleagues are shown the value of the intervention).	Adoption Acceptability Sustainability Diffusion	Evans, 2015; Atkins et al., 2008; Drmic et al., 2017; McLoughlin et al., 2022; Chambers et al., 2020; Asada et al., 2020; Wolfenden et al., 2017.
CERQual confidence rating: Low				

Summary

Less evidence supports the impact of local opinion leaders and there is variation in terms of who is likely to be an opinion leader and the actions they may take. In some studies opinion leaders are assumed to be school leaders who are presenting a new intervention to staff, which appears to miss some of the intention of the strategy and benefit demonstrated in the ICAMO above in terms of uniting staff attitudes towards an intervention, including those that may initially be resistant when a new intervention is presented. Given the smaller range of evidence and variation in opinion leaders and outcomes, there are concerns in relation to the coherence of this finding and adequacy of the evidence supporting it. Therefore, the ICAMO is rated at a lower confidence level. It is likely that opinion leaders may not be sufficient to generate buy-in and adoption alone.

34. Recruit, designate, and train for leadership

SISTER Strategy 34 concerns the need to recruit, designate, and train leaders for implementation of a new intervention so they can effectively engage in leadership behaviours that support others to adopt and deliver the new practice. We assume that 'leaders' refers to a range of roles related to implementation rather than only school leaders. Indeed, the strategy implies upskilling staff to lead on a specific implementation effort rather than focusing on upskilling school leaders' implementation knowledge and behaviours.

Definitions in the literature

Leaders need to be prepared for the multifaceted and complex demands of leading implementation (Melgarejo et al., 2020), which are different from leading a school or broader school improvement. Evidence demonstrates that leaders have an integral role in all phases of implementation (Desomine 2002). They help to choose the correct implementation design and professional development, allocate resources, schedule staff, and build and maintain productive and positive relationships with staff and students inside and stakeholders outside the school. Leaders need to have the knowledge, understanding, and skills to perform these aspects of their implementation role to a high standard. Where implementation leaders are inexperienced, lack confidence, or unable for any other reason to perform these aspects to a high standard then action needs to be taken to address this, such as delegating, recruiting, and training. Although the evidence suggests that leader's implementation behaviour is separate from the specific skills and behaviour needed to lead an intervention, this may imply the need for professional development that complements ongoing training in relation to an intervention. Although the focus is leadership behaviour and skills in relation to implementation of evidence informed practice, it is not only focused on school leaders, rather any staff that may be leading implementation decisions or leading on delivery of an intervention.

To what extent does the evidence indicate outcomes?

Several studies suggest the impact of this strategy on fidelity as an implementation outcome. These range from studies focusing on leaders' implementation behaviour to those considering this as part of a range of other strategies. The focus in these and other studies we located seems to be on existing behaviours or training rather than any recruiting or designation to roles.

Williams et al. (2022) tested the theoretically derived prediction that focused implementation leadership behaviours demonstrated by school leaders will impact implementation climate and lead to improved fidelity from teachers delivering interventions for pupils with autism varying in complexity. U.S. educators in elementary school autism special education classrooms participated. School leaders' implementation behaviours in this study (such as, being proactive, knowledgeable, supportive, and committed to evidence-based interventions), measured using the Implementation Leadership Scale (Aarons et al., 2014), were strongly associated with observed educator fidelity to pivotal response training (the more complex of three interventions assessed) above and beyond resources or professional development opportunities provided in relation to the interventions. This provides initial evidence that implementation leadership behaviours and school implementation climate could be key when interventions are more challenging for teachers to introduce.

In a similar study from the same author team, Melgarejo et al. (2020) demonstrated that 'optimal leadership' as measured using the Multifactor Leadership Questionnaire and including high levels of transformational and transactional leadership was both more associated with positive implementation climate and fidelity for the complex pivotal response training intervention.

A study based on interviews with programme stakeholders in secondary schools in Wales where a social and emotional learning (SEL) intervention was being implemented found that it was imperative that sufficient information and expertise are provided to school leaders to know how to best support implementation to see diffusion or reach as an outcome, even though champions are identified and used as part of the intervention to aid adoption (Evans et al., 2015). For this SEL intervention, Evans et al. (2015) suggest school leaders should engage in debates around the theoretical basis for the intervention to get the balance between adaptations to accommodate contextual needs and maintain fidelity, e.g. by discussing intervention logic models.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. 'Recruit, designate, and train for leadership' was one of 37 implementation strategies used by stakeholders including researchers and school staff. The designation and training mentioned included intervention group leaders, school staff co-facilitators, and mentors from the community. Therefore, this study indicates that the target of this strategy is not necessarily school leaders but can be those who might be assuming leading an intervention while colleagues may not. The strategy was linked to fidelity, sustainability, and acceptability outcomes. The study also placed this strategy as happening across preparation and delivery of the intervention.

In contrast, Gunderson et al. (2021) report that their use of 'recruit, designate, and train for leadership' behaviour was completed as school staff prepared to introduce evidence informed practices to reduce suicidality among LGBTQ high school students. They conducted qualitative interviews with school staff implementing these interventions to identify SISTER implementation strategies that were used. In relation to this strategy, the focus was on training leadership behaviour to support the use of evidence informed practices and liaison with stakeholders including intervention developers, parents, and pupil representatives. Again, though, the target were team leads who led the implementation in school, including team planning and assigning tasks but not necessarily school leaders and more likely to be considered champions, who later worked as part of implementation teams.

A scoping review of school diabetes care including papers with qualitative and quantitative study designs found that well-informed school leaders was one of several facilitators to forming a responsible and efficient school diabetes management team (An et al., 2021).

In summary, one review, two quantitative studies, and three qualitative studies demonstrate beneficial impact of implementation leadership behaviour on outcomes that include fidelity. There was only isolated evidence that training implementation leaders also improved acceptability and sustainability outcomes. The evidence reviewed seems to be on existing behaviours or leadership training rather than any recruiting or designation to implementation leadership roles.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence suggests leaders are more likely to need professional development when the intervention is new to them. So, while much of the focus may be on broader implementation behaviours, a lack of knowledge about the intervention can be a barrier to adoption. Simmons and Martin (2019) reported that school leaders should be the first in the school to be trained to furnish them with the knowledge to support staff, confidently act as role models, and provide contextual feedback to trainers prior to staff professional development. A study on instructional leadership implementation by Goldring et al. (2015) found most issues with implementation arose because of how leaders acted. For example, some did not have sufficient understanding of the intervention to reap its benefits. Their study also highlighted that leaders can have difficulty refocusing from management of the school to the demands of the intervention, in this case more focus on teaching practice. In this study, this was less of an issue for elementary and middle school leaders than it was for high school leaders. This was explained by high school leaders not having the requisite instructional skill levels to want to demonstrate them.

The importance of leaders' professional development is supported by Reumann-Moore et al. (2011) in their study on a literacy intervention where templates for writing tasks are used across the curriculum. When there was strong school leadership in relation to the intervention characterised by championing the intervention, align the intervention with other literacy initiatives, provide resources to support the intervention, and provide teachers with feedback about their intervention teachers tended to have higher buy-in, knowledge about the tool, and see more use of the templates in the classroom.

What does the evidence tell us about how the strategy works well?

In a review by Desimone (2002) of Comprehensive School Reform Models there was evidence that school staff view leader's knowledge in relation to the intervention and pupils needs as the most critical leadership behaviour. When leaders know the needs of their pupils they are better able to determine appropriate intervention, although leaders also need a strong understanding of the processes and procedures related to the intervention (Simmons and Martin, 2016). Desimone (2002) also notes that leaders need necessary resources, have autonomy—including over curriculum, teaching, budgeting, staff, and school mission—and have their role and responsibilities in relation to implementation made clear. Kannapel et al. (2000) in a U.S. study of elementary school reform also found principal leadership behaviour was a critical element in implementation. In the most successful reforming school, the principal not only acted as a school leader but also as an instructional leader and motivator.

Evidence has an important role in informing implementation processes. In a rapid evidence review of effective approaches to evidence-informed teaching by Nelson and O'Beirne (2014) they conclude that leaders need to have a belief in the value of pursuing an evidence-informed practice, and the need for an evidence-informed approach embedded in their own practice, and they recommend this should have a high priority in professional development for leaders, including strategies for critically appraising and using evidence to support effective decision-making.

A study observing leaders in U.S. high schools implementing block scheduling found effective implementation of change is also dependent upon a leader's ability to foster conditions characteristic of healthy schools (Salvaterra et al. 1998). These characteristics, that include continuous communication of goals and processing feedback from teachers to identify teacher needs as related to their present stage of concern, are essential. Effective leaders were evidenced as those who recognise where individual teachers are in the process of change and base their practice on the characteristics of healthy schools. Also, where leadership is shared by teachers and leaders, effective change is more likely to occur.

In a U.S. Common Core State Standards curriculum reform study where school leaders were interviewed, Brown and Vargo (2014) found leaders and teachers are essential participants in implementing the technical change and in managing politics of change. Many of the districts had combined professional learning about technical changes with leadership development activities for site administrators and teacher leaders. Many district-level staff reported meeting on a one-on-one basis with leaders more frequently to ensure that they have the coaching, support, and key messages they need to lead the change at their sites.

Chang et al. (2008) surveyed over 1,000 teachers about technology leadership in Taiwanese schools. Their analysis revealed dimensions and performance indicators related to valued school leader behaviours. Among the five dimensions analysed, 'Interpersonal and Communication Skills' was the most important for those surveyed, which included communication, relationships, understanding needs and concerns, and encouragement. This finding, amongst others, means Chang et al. (2008) identify some broader leadership behaviours relevant to implementation. Teachers saw it as important that school leaders advocated for the intervention and empower others to become specialists. This latter point may conflict with other findings that suggest it is important that school leaders are seen as skilled users of technology (Simmons and Martin, 2016) and research that raises the challenges for school leaders of delegating specialisms (Goldring et al., 2015).

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Leaders often have little time to focus on the implementation of interventions and in some research this is identified as a barrier to adoption. In a study on the implementation of the Inquiry Team Process in New York City public schools, Robinson et al. (2008) found delays were attributed, in part, to the leader being too overwhelmed with other work to support the implementation. In Derrington and Campbell's (2015) study of teacher evaluation they found implementation required a significant increase in leadership time, with increased out of hours workloads and in some cases family and vacation plans were cancelled. This indicates that knowledge of the demands of the implementation should be prepared for and streamlining adaptations made, in this case to the state data reporting system.

Leaders can overestimate their knowledge. Medina et al. (2019) in their study of community school implementation found that leaders (new leaders in this case), did not fully understand the tenets of community schools services but assumed that they did. This led to services being compromised after they made decision to reduce the number of people on-site with the requisite knowledge.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to recruiting, designating, and training for implementation leadership because there needs to be support in place and this can often be ongoing and transferable in relation to implementation generally, rather than skills specific to putting in place an intervention. Implementation leaders are *agents for change* when they can support and empower other staff to implement a new intervention. Part of the focus therefore is on developing the skills to lead and support others. Because of this, *enabling structures* are evidenced as being more necessary to allow this strategy to happen, leaders becoming *agents for change* would be part of the outcome of this strategy. Implementation leaders seek to *unite* others working in relation to a new intervention, supporting them through both supporting structures and motivating around the importance of their role. Part of the *uniting* of values is in terms of distributing leadership in relation to implementation.

Our realist synthesis indicated the interaction of *enabling structures* and *uniting* as key to implementation leadership and impacting a range of implementation outcomes across phases of implementation.

ICAMO configuration for recruit, designate and train for leadership

Enabling structures are necessary so that implementation leaders are in these roles and have support in terms of training, resources, and necessary relationships to be able to lead and support other staff involved in implementation. Implementation leaders need to have the knowledge, understanding, and skills to perform these activities to a high standard. They may need to develop this, or staff identified or appointed who do. Once implementation leaders have the skills and resources required they can unite those involved in implementation confidently in terms of the practices and values required to achieve implementation over time. The evidence indicates that this context and mechanism strengthens implementation outcomes, in particular, in adoption, fidelity, and sustainability.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 34: Recruit, designate, and train for leadership Recruit, designate, and train leaders for the change effort so they can effectively engage in leadership behaviours that support others to adopt and deliver the new practice.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structure: resources, including professional development for implementation leaders.	Implementation leaders primarily and then staff supported by them.	Uniting: using existing or developed skills and resources to unite implementation values and practice across staff involved.	Adoption, fidelity, and sustainability.	Williams et al., 2022; Melgarejo et al., 2020; Evans et al 2015; An et al., 2021; Simmons and Martin, 2019; Reumann-Moore et al., 2011; Nelson and O'Beirne, 2014; Chang et al., 2008.
CERQual confidence rating: Low				

Summary

Some evidence suggests the importance of implementation leadership skills and a range of school staff being involved in leading implementation. The evidence tends to speak to the importance of the skills and the principles of distributing leadership rather than evidence that particular training or roles are likely to impact on implementation outcomes. Although the strategy is relevant to a range of implementation leadership, rather than school leadership, some of the evidence tends to indicate models for school leaders to support implementation. As such there are concerns in relation to the relevance of the evidence to the strategy and adequacy of the evidence contributing to this finding. So we rate the ICAMO with lower confidence; the context and mechanism are critical in relation to leading implementation but the outcomes indicated are driven by other strategies, rather than only support from leaders.

48. Create new practice teams

SISTER Strategy 48, 'create new practice teams', is categorised by Cook et al. (2019) as a strategy to support practitioners. It is described as changing who serves on the team supporting the implementation effort such that different disciplines and skills are represented to make it more likely that the practice is delivered successfully. Creating a practice team may be most effective when it is considered in the prepare stage of implementation, after the intervention to be delivered is decided but before it is introduced more widely to the school (Chambers et al., 2020; Crane et al., 2021). We have assumed that strategy 35, Use Advisory Boards and Workgroups, is very similar and can be subsumed under this one about implementation teams.

Definitions in the literature

Practice teams tend to be referred to by a range of other terms in the literature. Arguably terms like 'implementation team' (Freeman et al., 2014) or 'project team' (Gale et al., 2020) make it clearer that such a team holds responsibility for planning and operationalising implementation rather than being a team of practitioners who are, or would be, delivering the intervention.

To what extent does the evidence indicate outcomes?

There is evidence that implementation teams can improve adoption, buy-in, and sustainability implementation outcomes. However, impact on outcomes tends to be reported when implementation teams hold certain features, like staff with the right knowledge.

Freeman et al. (2014) found in a study interviewing implementation team participants about factors that facilitated implementation of a whole-school conflict resolution programme that including individuals with different roles in the implementation team facilitated knowledge sharing and idea generation as part of an implementation team. For example, one participant felt teams were effective because 'the knowledge isn't just residing in one or even two people, you had

a group of four teachers effectively who could be sharing and bouncing ideas, information, successes and failures off each other' (p.860).

Mclsaac et al. (2015) conducted an exploratory mixed-methods case study focusing on the implementation of Health-Promoting Schools in nine Canadian schools. Their analysis showed that in the four schools sustaining their health-promoting schools practice there was a committee or team that met to plan school development activities.

In a multiple case study design using in depth interviews with a range of individuals involved in using school referral systems for sexual health services, Leung et al. (2020) found that meetings (between the programme coordinator, district and school leaders) were a key strategy to engage the appropriate individuals in implementation. Therefore, this supports the idea inherent in the strategy that a range of roles is necessary in an implementation team.

In summary, a small amount of evidence including two mixed-methods studies and one qualitative study demonstrate beneficial impact of creating implementation teams on outcomes such as adoption, buy-in, and sustainability implementation outcomes. However, teams tend to produce these outcomes when they hold certain features, like staff with the right knowledge.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence suggests the specific staff members who are best placed to be in the implementation team will vary according to the intervention. Implementation teams are more successful where team members have a range of skills and expertise, relevant to the content and processes that will be necessary to deliver the intervention. For example, Chambers et al. (2020) found that dining hall supervisors were key individuals to take Universal Free School Meals forward, because they had the best insight on children's diets. Morrison et al. (2019) suggests that including a guidance counsellor in their core team would facilitate implementation of a social-emotional learning intervention. This is because the core team would then be better equipped to support others through their experience and knowledge of the improvement area. Creating a diverse practice team also helps to ensure that key groups take forward the necessary work for implementation. This is because a representative member is provided with the opportunity to make suggestions and shape the policy, a process which contributes to greater cognitive participation and engagement of staff who will implement the practice (Chambers et al., 2020).

The strategy to put in place an intervention team can interact with other strategies. For instance, Freeman et al. (2014) report that implementation teams facilitated professional development and having a team able to deliver professional development can overcome some limitations of only training one 'trainer' to cascade training throughout a school. Equally, evidence notes the association with champions, where either one champion will be part of the implementation team or the whole team are likely to be acting as champions.

What does the evidence tell us about how the strategy works well?

A range of empirical evidence shows what implementation teams do as part of their work. A particularly relevant study by Higgins et al. (2012) investigate how diversity in terms of role and experience on school implementation teams relate to team member learning; 226 team members responded to a survey about their implementation team's sociostructural features and individual's learning from their team. The findings suggest that team members learn more and have greater consideration for a range of stakeholders when they are on a diverse team representing a range of school roles. However, authors note that too much diversity can lead to information overload and a lack of direction. The findings also raise the implication of keeping team roles stable, appreciating that membership may change over time.

Freeman et al.'s (2014) findings indicate the roles that implementation team members described holding that helped facilitate the intervention. These roles included providing leadership, meeting regularly, learning new concepts and skills to support staff and provide professional development, providing reminders, and encouraging commitment and ownership in those delivering the intervention. Teams in this study typically had between three and five members.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students. They identified SISTER implementation strategies that were used. Schools were supported to use the Dynamic Adaptation Process, which combines several implementation strategies. As part of this an implementation team is established in schools. Although this happens in the prepare phase of implementation, the team was encouraged to review earlier data to consider adaptations to the school environment and the support staff will need. The support schools received included establishing a team—and this team were highly involved in using other strategies—yet the teams often independently changed their membership according to perceived skill or knowledge needs and staff turnover or workload. Different team leads emerged over time too, indicating the potential benefit of having a team leader, which is not often mentioned in other research. The main work of the teams was to assess, strategize, and plan actions. Schools also developed community advisory boards including educators, local authority staff, and representatives of support organisations. This suggests at times separate teams may be necessary and indicates that the implementation team often comprises school staff directly involved in the intervention.

McLoughlin et al. (2020) investigated factors within and outside the school environment that influenced school's capacity for implementation and sustainability of a whole school wellness programme in elementary schools. Their findings

support regular core team meetings which can be used to plan and coordinate implementation strategies. The school wellness intervention being assessed involved forming a school wellness team of three or more members and assigning a leader. Most school implementation teams did meet regularly over the course of the project. Qualitative data showed how teams needed to be adaptable, for instance rather than meeting at a fixed time, meeting briefly before or after school, within allocated planning time, and/or communicating through email.

Evidence suggests that the core team can be more effective when it includes a member of senior leadership, such as a principal or assistant principal (Dyssegard et al., 2017; Freeman et al., 2014; Leis et al., 2017; Pearlman, 2005). However, the relationship between senior staff and other members of the team will be crucial to how well this collaboration functions (Pearlman, 2005). For example, Crane et al., (2021) found that teams more effectively facilitated the implementation and sustainability phases of CCAL (a computer-assisted intervention for anxious youth) if they included a school administrator as this person was able to allocate time for training, make resources available, initiate the programme, and disseminate information about it. However, some participants felt that implementation was facilitated by administrators having a 'hands-off' approach. This suggests that when creating an implementation team it may be important to include an individual who has the authority to facilitate implementation at a logistical level. Where a team does include a member of senior leadership it may be even more necessary to ensure that the team members continue to feel as though they have autonomy and influence. Dysegaard et al.'s (2017) review suggests that trust and shared leadership extended to implementation team members is important for implementation outcomes and that a lack of this or support with the intervention from a school leader can impact fidelity.

Flaspohler et al. (2012) report an evaluation of a support system designed to help elementary and middle schools implement whole-school prevention interventions. Part of this involved the support system assisting implementation teams in collecting and using data on fidelity and pupil outcomes. The implementation team in each school was interdisciplinary and this was designed to promote buy-in from staff with a range of responsibilities. A feature of the implementation teams in this project not seen in other literature was the community of practice established between teams working with the intervention in different schools. Finally, the paper argues for the importance of implementation teams being given time to reflect to consider both successes and challenges to then engage in shared problem-solving.

Leis et al. (2017) conducted a mixed-methods study investigating the relationship between successful implementation of a professional development and coaching model designed to build trust and enhance communication among colleagues in schools and changes in teacher-leadership trust in eight U.S. schools. Level of implementation was measured using the Implementation Process for Teams measure of competence and commitment to the 'Leading Together' intervention. This allowed comparison between schools scoring higher versus lower on implementation outcomes. As part of the intervention a team works together to introduce and implement the intervention in their school. The team involves the school leader. Higher scoring schools scored significantly higher on team commitment. They met more consistently than lower scoring schools and reflected on change to address any barriers. The findings also suggest the importance of communication from the team to other staff in terms of explaining the purpose and benefit of the intervention. The authors suggest that team meetings could be used to script this.

Likewise, Ryan Jackson et al. (2018) also describe the key communication loops involved in implementation teams. Firstly, the team need to share information with one another as needed and this will not only be confined to meetings. The team also provide a communication link from staff delivering the intervention to school leadership. In this way barriers and support need can be directed to those who can solve bigger issues.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Pearlman et al. (2005) assessed outcome and process evaluation data from four elementary schools using the School Health Index to create healthier environments in schools. The school leader played a pivotal role as part of the implementation team in each school, although in the fourth school existing tension between the school leader and staff was a barrier. In this study, implementation teams were reported to range in size from five to more than 20 members. Regardless of the teams' size, regular attendance at team meetings was reported to be challenging. Team size did not appear to be key to implementation outcomes: what mattered more was the positivity and proactive nature of teams. Three of the four teams were subcommittees of the School Improvement Team at the school and therefore shows that implementation teams can fit within existing structures, but this does not in itself guarantee regular attendance at meetings.

Lohrmann et al. (2008) conducted a qualitative study with practitioners who provide schools assistance when implementing school-wide positive behaviour support seeking to identify and understand barriers to school staff adoption of the intervention. Buy-in from other staff was a barrier to adoption encountered by the implementation teams that are expected as part of this universal behaviour intervention. To address this, participants reported three things that they did: teams communicated with staff about the intervention, providing updates and reminders; worked with staff to take a more active role in designing intervention components; and celebrated staff participation in planning and intervention design to maintain motivation and encourage others.

What does our realist review show are relevant contexts and mechanisms?

The key contextual factor that drives the success of this strategy is *agents for change*. Evidence suggests that having a member of senior leadership in the implementation team can make this strategy more effective. They are a key agent for change because they increase the likelihood of the team being supported at a logistical level as they can provide access to *enabling structures* (such as timetabling, funding, training opportunities and supportive networks). The other team members selected are also key agents for change that influence the success of this strategy. Arguably it is the agents for change as part of the implementation team that make the team an enabling structure or set the structures needed for the team to function. Having a diverse implementation team with a varied set of skills and expertise relevant to the intervention, means that implementation is more likely to be informed by a range of perspectives. The strategy therefore provides an opportunity to *engage* voices in the implementation process, rather than it be a top-down introduction of change driven by an individual. Evidence suggests that with these *agents for change* in place, teams can facilitate the flow of information to and from senior leaders and staff members who will have a more active role in the delivery of the intervention. *Engaging* voices with these collaborative, diverse practice teams could foster greater cognitive participation and engagement of staff who will implement the practice (Chambers et al., 2020). Part of implementation teams' work is likely to involve *reflecting* on data and problem-solving, however, the evidence suggests the engagement across team members and with other staff is linked to the success of the team.

Intervention features is also an important context for this strategy because it determines the skills and expertise required from team members. Schools may therefore need different core team members for different interventions. The complexity of the intervention may also impact how many team members are required and how complex communication is between team members (Leung et al., 2020).

Our realist synthesis indicated the interaction of agents for change in an implementation team informed by the features of the intervention helps to engage other staff impacting adoption and sustainability as indicated in the ICAMO configuration below.

ICAMO configuration for practice teams

When creating a practice team, selecting the right staff who will have relevant expertise, experience, and hold responsibility for guiding the implementation is key. Team make up will be dependent on the type of intervention as relevant expertise and experience will vary. The team members need to be empowered with responsibility and to represent a range of relevant staff in order to be Agents for Change. An individual may be well suited to facilitate the intervention if they understand the existing processes that relate to the improvement need and a practical understanding of how any new intervention will be received by affected staff members. They may be well suited to foresee challenges with implementation and offer suggestions to overcome these. In addition to this expertise, the literature recognises that those with experience in implementing new approaches, leadership experience, and authority to make resources available are also key individuals to be in the implementation team. These individuals have the greatest ability to facilitate the teams' decision-making at a logistical level. Within this team setting, school leaders need to foster opportunities for team members to share knowledge and contribute their voice to meetings and decision-making. A representative team will not only engage a range of key voices but also be able to feed in views from other staff that team members will communicate with. This communicative aspect of the team process will allow the school to benefit from the expertise of all those in the team. On one hand, knowledge sharing within the team can help to foresee challenges that will arise during implementation, and solutions which can be planned to facilitate long-term sustainability. On the other hand, key staff groups can feel that their perspective has been represented in decision-making, and this can facilitate greater buy-in to the implementation effort.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation strategy 48: Create new practice teams				
Change who serves on the team supporting the practice or implementation effort, adding different disciplines (counsellor, school psychologist, behaviour specialist, school-based mental health provider) and different skills to make it more likely that the new practices is delivered—or is more successfully delivered.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change (roles with responsibility that are core to the implementation)	A range of individuals, including senior leadership.	Engaging voices of key individuals who have a diverse set of skills and knowledge with regards to the	Facilitates knowledge-sharing, ability to support others, and	Chambers et al., 2020; Morrison et al., 2019; Freeman et al., 2014; McIsaac et al., 2015; Leung et al., 2020; Higgins

effort and represent relevant, diverse knowledge and perspectives) and intervention features (deciding the expertise needed).		improvement area. Team members also engage with and represent other staff.	participation of key staff groups: Buy-in Adoption Sustainability	et al., 2012; McLoughlin et al., 2020; Lohrmann et al., 2008.
CERQual confidence rating: Low				

Summary

A range of evidence supports the importance of implementation teams and getting the make up and structure right as key. Compared to other strategies there is relatively less evidence that suggests the impact of having implementation teams versus not using this strategy. Instead, a wealth of evidence indicates the importance of the team being well-represented and having the power to make decisions, perhaps through a team member being a school leader. The implementation team can represent a wide range of staff and bring a diverse range of expertise to implementation decision-making. However, the implementation team is often putting in place other strategies and sometimes tailoring implementation strategies. The team composition and action will depend on the intervention, with some interventions expecting project teams either while preparing for implementation or throughout. The ICAMO is rated as a lower level of confidence given the adequacy of the data that creating the practice team alone would lead to outcomes; rather, it is the more specific actions and representation of the team that will impact on outcomes.

43. Make training dynamic

SISTER Strategy 43, 'make training dynamic', is categorised by Cook et al. (2019) as a strategy to train and educate stakeholders. It is described as varying the information delivery methods to cater to different learning styles, structures for professional development, and to be interactive.

To what extent does the evidence indicate outcomes?

Several studies indicate the benefit of professional development that is considered dynamic including in comparison to more didactic training. While the reviews located do not pinpoint implementation outcomes, other empirical studies show the beneficial impact of dynamic training on fidelity, acceptability, and sustainability across multiple studies.

Lyon et al. (2011) review training and support approaches that may be applied to training in mental health. The review draws on an interdisciplinary literature including teacher training as well as more clinical training. Didactic workshop training models can be effective for disseminating information and improve provider knowledge but are limited to the extent that it produces consistent or sustained in behaviour. More interactive strategies, such as modelling and role plays, have more evidence of implementation outcomes.

When building knowledge through professional development, the EEF evidence review on PD recommends managing cognitive load (mechanism 1) (Sims et al., 2021). The goal reported by the review should be to avoid overloading participants with too much information and instead build knowledge incrementally. The review suggests this is achieved by removing less relevant content, combining verbal and visual instruction, and varying the presentation of information. This relates well to the assumed definition of dynamic training for this strategy.

Gregory et al. (2021) conducted qualitative interviews with practitioners using restorative practices as a behavioural approach in U.S. schools. The study aimed to identify components of implementation that supported building infrastructure, increasing staff and student capacity, and putting in place different levels of support. Participants framed the professional development they received as continuous and experiential. Here PD complemented the kind of intervention. For instance, there were dynamic kinds of PD such as cultural book studies, restorative participation, and coaching. It was also noted that the level of support needed to vary across different levels of staff experience. Authors argue that strengthening capacity in this way alongside other implementation strategies including student involvement has helped to sustain the intervention in these schools.

Zhang et al. (2023) conducted a randomised controlled trial assessing whether initial professional development informed by social cognitive theory increased intention to implement, fidelity, and pupil behavioural outcomes compared to a control group who met with administrators before both groups received typical training and two follow up consultation sessions for proactive classroom behavioural management strategies intervention. Teachers in the enhanced training group demonstrated significantly larger improvement on all three outcomes. The social cognitive theory informed professional development included growth mindset components and public commitment to a belief in growth mindset.

We categorise this as an example of ‘dynamic training’ as it seeks to change teachers’ interaction with professional development.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. ‘Make training dynamic’ was one of 37 implementation strategies used. Training included a mixture of lecture, role play, discussion, and activities and exercises to increase participation and sustain attention. Although a range of strategies were used, authors consider this strategy to link to acceptability and fidelity outcomes.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies; participants considered make training dynamic as the most feasible implementation strategy but also one of the most important.

In summary, two reviews, two quantitative studies, and two qualitative studies demonstrate some beneficial impact of making training dynamic on outcomes that include adoption, fidelity, sustainability and pupil outcomes. The evidence reviewed suggests beneficial outcomes when dynamic training varies in terms of focus on more practical changes or addressing teachers’ views about their practice.

What does the evidence tell us about the situations in which schools might use this strategy?

A study based on interviews with programme stakeholders in secondary schools in Wales where a social and emotional learning (SEL) intervention was being implemented focused on diffusion and noted professional development as a potential reinvention point—adaptation to the programme in response to context and individual needs (Evans et al., 2015). However, the study points to the risk of balancing dynamic training with providing sufficient expertise. Participants valued the support group aspect where they simulated delivery and participation in the intervention but also reported that they had inadequate expertise across all the twelve components of the intervention leading to adaptations as the intervention diffused and contacting the study author for further guidance. This suggests that schools might use this strategy to tailor professional development to need but it may be more beneficial when training does not also seek to transfer large quantities of knowledge about an intervention.

What does the evidence tell us about how the strategy works well?

As indicated above, one way in which training may be dynamic is to respond to the particular needs and concerns of different staff. In an evaluation of middle and high school chemistry teachers use of technology-enhanced learning, Gabby et al. (2017) found that the training needs of these teachers varied given curriculum differences. There was also a need to keep training updated given the focus of this intervention.

Fisher et al. (2020) evaluate adoption and sustainability outcomes in their process evaluation of mental health first aid and peer support for secondary school staff. Their findings suggest the tension between fidelity of professional development and either planned or emerging needs to retain flexibility. Trainers delivering mental health first aid described how they added active tasks if needed to raise participation and also responded to dynamics in the group. This study also shows how trainers need to be dynamic in their delivery in relation to the training setting (with interruptions challenges in schools) and fitting the training around the school timetable. It indicates how this strategy may be of relevance to those delivering professional development, whether school staff or not.

Beidas and Kendall (2010) reviewed school-based—as well as clinic and community—studies training therapists in evidence-based interventions and found that only professional development that includes active learning along with ongoing coaching and feedback was effective in promoting clinician change. This suggests the importance of both this strategy and those referring to ongoing professional development and coaching.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Making training dynamic was elaborated by school staff in four schools, complementing researcher-led training with staff team-led training, guest lectures, and classroom activities.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Facilitators for dynamic training include opportunities to practice the intervention. Aragon et al. (2021) directly describe the dynamic training that was delivered as part of a food and nutrition intervention where implementation was evaluated in a mixed-methods study. Their dynamic training included opportunities to practice delivering intervention components and receive feedback from trainers and peers. The beginning and end of the training stressed fidelity. Although a range of support was provided to teachers, the authors conclude that the focus on fidelity may have impacted this beneficial outcome. This study indicates that active training can therefore focus on consolidating knowledge of core components of interventions.

Freeman et al. (2014) report implementation team members reflections on facilitators to changes made in a qualitative study on the process of planning and introducing a whole-school conflict resolution focused programme in ten primary

schools. All staff received a day of professional development about the intervention. PD focused on conflict resolution concepts, skills, activities and role play practice, consideration of the cultural context and respect for cultural diversity, and time for planning. Participants considered the training to be active because it included both content and the opportunity to practice the intervention.

Miller et al. (2015) evaluated the EEF-funded Physically Active Lessons (PAL) intervention evaluation, which involves adapting lesson plans to combine short bursts of physical activity with academic content. It was piloted in six English primary schools and included an implementation and process evaluation. The qualitative findings revealed how training might be dynamic through structuring attendees to develop their own activities and lesson plans to be more ready to use the intervention. The second professional development session also focused on sharing challenges with other staff delivering the programme.

What does our realist review show are relevant contexts and mechanisms?

Professional development strategies all aim to unite knowledge and understanding about a new intervention or implementation more generally. Therefore, this implementation strategy and the other seven professional development strategies that we have analysed all seek to unite knowledge and understanding about an intervention. While professional development as an overarching implementation strategy has this increase in shared knowledge and understanding as driving outcomes, other mechanisms are also relevant for different kinds of strategies. Indeed, the EEF Professional Development Evidence Review identifies 14 PD mechanisms, not all of which relate only to developing knowledge (Sims et al., 2021). Making training dynamic is therefore a relevant example where dynamic training will *unite* knowledge, but the underlying mechanism implicated by this mechanism is that training is *engaging*. Our programme theory context of *agents for change* is relevant to dynamic professional development because the onus is upon the trainer to make training active and responsive. Dynamic training is likely to *engage* recipients and therefore more likely to see outcomes typical for professional development including adoption and fidelity. Because dynamic training is more likely to consider how a new approach fits in to practice and involve experiential components it may encourage recipients to *reflect* on the new approach and their practice. While professional development tends to *unite* understanding about an intervention and this is certainly the case here, the element of making training dynamic speaks to the unique underlying mechanism of engaging interest in the intervention through varied content and opportunity for role play which in turn can help to consolidate knowledge of the intervention. Our realist synthesis indicated this interaction of agents for change and engaging impacting buy-in, adoption and fidelity as indicated in the ICAMO configuration below.

ICAMO configuration for make training dynamic

The aim of strategy 43, Make Training Dynamic, is to motivate, engage, and consolidate knowledge among those who will drive change and the trainer is using this strategy to facilitate the transfer of key content about the intervention. The trainer therefore needs to be an agent for change, making decisions about how to engage recipients in the training. The key actors are the training providers as agents for change, who are responsible for making training engaging, and those receiving the training. Dynamic training engages participants and therefore allows them to embed knowledge through experience and explore the new practice from different perspectives e.g. role play and discussion. This can enrich their understanding of the new practice and allow participants to consider how new practices align with their own experiences (Evans 2015). Dynamic training can encourage teachers to adopt an intervention with fidelity. Through opportunities to consolidate knowledge in varied ways, engaged participants are likely to be able to practice elements of delivering the new approach and recall the training, which can help play a part in delivering interventions with more fidelity.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 43: Make training dynamic				
Vary the information delivery methods to cater to different learning styles, structures for professional development, and shape the training in new practices to be interactive.				
<u>C</u> ontext	<u>A</u> ctor	<u>M</u> echanism	<u>O</u> utcome	<u>E</u> vidence

Agents for change (trainers facilitate professional development that is dynamic and are responsive to needs).	Training deliverer and those receiving training	Engaging (indicates meaningful engagement, the strategy encourages training to be engaged with, so not surface level engagement).	Adoption Buy-in fidelity	Blaine et al., 2017; Kennedy et al., 2021; Gregory et al., 2021; Zhang et al., 2023; Moore et al., 2021; Evans et al., 2015; Beidas and Kendall, 2010.
CERQual confidence rating: Low				

Summary

Evidence that has focused on implementation strategies in school has typically reported the importance and some impact of making professional development dynamic. Evidence from a range of study designs indicates the impact of dynamic training being more responsive to the needs of implementers being trained and leading to fidelity in their delivery of the new approach. Given that dynamic training relies on both the trainer and the training to engage school staff it fits well with the revised programme theory that considers engaging as a more holistic underlying mechanism. However, making training dynamic and therefore engaging implementers alone is not likely to be sufficient in isolation to lead to adoption and fidelity, indicating concerns in relation to the coherence of this finding; there are other important elements of professional development considered across other strategies and indicated through other contexts and mechanisms that need to be considered too. Therefore, this ICAMO is rated as a moderate level of confidence.

38. Conduct educational outreach visits

SISTER Strategy 38, 'conduct educational outreach visits', is categorised by Cook et al. (2019) as a strategy to train and educate stakeholders. It is described as involving a trained person to meet with school staff in their settings to educate them about the new intervention. Generally, we assume that this strategy includes professional development from an expert delivered to staff while in school. Conducting educational outreach visits may be most effective when preparing teachers and gaining their support prior to the introduction of a new practice (Chambers et al., 2020; Crane et al., 2021).

To what extent does the evidence indicate outcomes?

A range of evidence including reviews suggests that professional development from a credible source can improve knowledge and implementation outcomes like fidelity. Overall, the evidence suggests that having a credible source may be one important component of professional development but may not improve outcomes in isolation. The EEF Professional Development Evidence Review suggests that effective PD provides information from a credible source (Sims et al., 2021), including having an expert teacher to promote the practice (mechanism 4). This evidence suggests that participants are more motivated to use and adopt a new practice if they find the information to be credible.

Lyon et al. (2011) review training and support approaches that may be applied to training in mental health. The review draws on an interdisciplinary literature including teacher training, as well as more clinical training. A specific technique evidenced in the review is 'educational outreach', characterised as in-person visits from trained personnel in a practitioner's work setting to share a new intervention and therefore fits closely with the definition used in the SISTER strategy. The strategy does not just target knowledge but motivation to use the intervention and therefore considers evidence, establishing credibility and addressing common barriers. Evidence suggests small to moderate effects on knowledge and attitudes. Some studies suggest these outreach visits are most effective when including feedback on practice from the trainer.

Austin et al. (2011) sought to identify barriers and facilitators to adopting a school-based physical activity intervention. In interviews they found that facilitators to implementing the intervention were most often reported to be external support. Interviews further reported that this external support related to the quality of resources and the research support for the intervention that was shared. This credibility of the support available was linked to fidelity and sustaining the intervention after a year.

More specific to professional development, Guhn et al. (2009) reviewed literature to synthesise factors that helped to sustain two school reform programmes. The professional development was provided by programme facilitators external to the school. Expert training can help ensure it is linked to intervention processes and outcomes. This is categorised as aiding staff competence. This PD was of the form of workshops, lectures, seminars, and presentations. In relation to sustainability of reforms, this study points to the need for PD to encourage opportunity for further work amongst school staff such as collaboration and reflection of the type noted in implementation strategy 32 focused on organising team meetings for reflection on practice.

Freeman et al. (2014) report implementation team members' reflections on facilitators to changes made in a qualitative study on the process of planning and introducing a whole-school conflict resolution focused programme in ten primary schools. All staff received a day of professional development about the intervention. However, when the implementation team were able to draw upon their more extensive PD and knowledge of the school context to train other staff they could link the intervention content to curriculum content and other socio-emotional learning interventions. This helped give the programme legitimacy to staff and feel more manageable, therefore impacting adoption. Therefore, at times it might be questioned whether the credible source will always be an external expert.

Bingham et al. (2018) evidence some of the impact of not including professional development from an expert. In a collective case study, they document challenges that occur in schools implementing technology-mediated personalised learning. It was felt that professional development and support teachers received was insufficient. It was indicated that lack of professional development was affecting teacher morale and would impact staff turnover. Professional development was not aligned to teacher needs and was felt to be too general and outdated. The study indicated that content of professional development was important, and examples of successful models and practices are key but may not always be available with new innovations.

Monzalve and Horner (2021) conducted a multiple baseline experimental design with four participants focused on improving the contextual fit of behaviour support plans and assessing impact on fidelity and target pupil behaviour. One of six core components of the intervention was making sure teachers had knowledge of behaviour support plan procedures and this was targeted in a team meeting led by the first author. The meeting also aimed to adapt the behavioural support plan to improve contextual fit and therefore put the training into practice. After use of the intervention, fidelity increased and pupil problem behaviour decreased, although this may not be due to the training from an expert in isolation.

In summary, three reviews, one quantitative study, one mixed-methods study, and two qualitative studies demonstrate some beneficial impact of conducting educational outreach visits—meaning a credible expert delivering professional development at a school—on outcomes that include adoption, fidelity, sustainability, and pupil outcomes. The evidence reviewed suggests that the content of professional development is also important and that the strategy may not impact fidelity, sustainability, and pupil outcomes in isolation.

What does the evidence tell us about the situations in which schools might use this strategy?

Alonge et al. (2020) describe a collaborative process for developing pathways used across countries for large scale implementation of school mental health programmes. The processes were based on theory of change workshops and feedback from a range of participants including policymakers, programme managers, mental health practitioners, and academics. Of relevance to professional development is the consideration of the type of intervention and how specialist it is. Here, tasks were shifted from mental health specialists to teachers and this required targeted training and supervision from mental health specialists. This was shown to be effective in the resource-limited contexts studied by Alonge et al. but implies educational outreach visit-style professional development may only be suited to less complex or specialist interventions.

What does the evidence tell us about how the strategy works well?

Goldstein and Olszewski (2015) describe the process of developing and implementing a phonological awareness curriculum designed for preschoolers demonstrating delays in literacy development. A post-hoc analysis mapped the stages of intervention development to the EPIS implementation model. This study shows that despite professional development being delivered by researchers, training and support can be determined in a more collaborative way. Researchers sought feedback from teachers and observed implementation of the intervention after professional development. This meant that further training and support needs could be identified. The study suggests a view that one-off expert training that is credible is unlikely to be sufficient.

Similarly, Leeman et al. (2018) suggest that the relationship between the expert delivering the professional development and recipients may be more important than the characteristics of the content. Leeman et al. evaluated how staff working nationally in school district offices and local schools used several tools to help support the integration of health interventions in schools. Interview data suggests the importance of relationships, particularly with key school staff like wellness champions, in relation to this intervention. Experts aiming to encourage the adoption of interventions from districts were aware that their content did not matter if they could not access the school.

Brock and Carter (2017) systematically reviewed group design studies assessing the effectiveness of professional development to improve implementation of interventions for pupils with special educational needs and disabilities. Twelve studies were included. Overall, there was a strong beneficial effect of professional development on implementation fidelity. Interestingly, the review findings demonstrate that neither duration of training or one to one PD format were associated with changes in fidelity. However, PD that included both modelling and performance feedback was associated with greater fidelity. This suggests the type of professional development may be key, alongside the training source.

Hu and Veen (2020) set out to explore features in the professional development process that are barriers or facilitators to teachers' engagement and learning from PD. They interviewed seven coaches and 11 teachers that were part of an observation based programme. While the focus here was on coaching, rather than a visiting trainer, the aims of the study are clearly of relevance. They found that it was important that the coach has an awareness of the issues at the school, can adapt their style of teaching, has relevant expertise and experience, is able to help teachers to solve problems, and can challenge teachers' practice as a friendly peer (demonstrating reflectivity themselves) rather than as an authoritarian expert. This evidence, as elsewhere, speaks to the need to consider professional development strategies together.

Lane et al. (2022) analysed data collected from a mixed-methods trial of a physical activity intervention in Australian Primary Schools. The PACE intervention includes eight implementation strategies including a professional development; this was delivered by the in-school champion. This educational outreach visit was, however, the strategy that had the lowest fidelity and did not appear to impact adoption. There was qualitative data that showed the training improved teacher attitudes to, and engagement with, the intervention and increased buy-in and knowledge of the intervention. The issue appeared to be champions with lower power or interest struggled to deliver the training. The implication is that schools may vary in their need for externally delivered training but internal sources may need support to demonstrate their credibility.

Mohammed and Harlech-Jones (2008) conducted a case study of university-delivered in-service teacher education reform. The case study focused on barriers to implementation related to teacher educators not adapting to the contexts in which teachers were practicing. This has been noted in other more recent and rigorous studies. However, of interest in this study was the finding that professional development was fundamentally aiming for teachers to thoroughly learn a new approach. The authors argue that the cognitive and behavioural change associated with deep learning and procedural knowledge cannot come only from directed professional development but needs inquiry, intelligent adaptation, and problem-solving in practice.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Cane and Oland (2015) present findings from four focus groups with schools that took part in the delivery of a universal and targeted mental health support intervention in England. While participants considered the staff training received valuable, there were issues with it being isolated. Firstly, two schools wanted to be able to cascade training to other staff over time. Furthermore, two schools requested further training, expressing the concern that with too little training staff might do harm rather than be able to help pupils.

Related to the point about professional development fitting teachers' needs, Owens et al. (2019), in a pilot study considering the feasibility and effectiveness of an online daily report card by elementary school teachers, showed that even when the intervention was targeted towards teachers who had not previously received professional development on the intervention, teachers had a range of professional development needs which could not easily be addressed through online professional development built into the intervention resources. It concluded that some teachers need professional development that involves consultation and a problem-solving approach, implying that the professional development strategy used may need to vary across school staff, as well as by intervention. Guhn et al. (2009) go further in their systematic review and argue based on sustained school reform projects that prior needs assessment should go hand in hand with professional development.

Walker et al. (2022) conducted a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. Participants felt that onsite training was helpful to get buy-in from other staff members, although attendance tended to be low and often not mandated by school leaders. This created a tension where the training was perceived to increase buy-in but school leaders assumed staff should choose whether to attend. Overall, staff felt that onsite training was not sufficient in isolation and offsite training and train-the-trainer models led to greater adoption.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to this PD strategy as well as others that involve training because training needs to be accommodated, often funded, and timetabled. *Agents for Change* is also relevant because the trainer ought to be a credible expert who can impart knowledge to school staff. The PD required is likely to vary according to *intervention features*, such as resources available, complexity, and research evidence. This indicates how it is a key condition for this strategy. The mechanism of *uniting*, specifically uniting knowledge about the intervention and how it is put into practice, is key.

Our realist synthesis indicated the interaction of the context intervention features with the mechanism uniting impacting buy-in, fidelity, and sustainability outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for educational outreach visits

For the strategy 'conduct educational outreach visits' the programme theory context of intervention features are relevant because the strategy requires someone who is knowledgeable about the intervention. A well-established intervention

may have more experts available for the school to utilise. A range of intervention features—like the core components, feasibility, adaptability, research evidence, and capabilities needed—will inform professional development content as well as the credibility of the source. The key actor in this strategy is the expert, who may have ‘developed the intervention, received certified training in the practice, and/or extensive experience implementing the practice’ (Cook et al., 2019). Their ability to drive changes to practice requires an affirming relationship between the trainer and recipients and across recipients too with trust, availability, and credibility (Hargreaves and Elhawary, 2019). It may be counterproductive if the trainer appears authoritative and carries a sense of power over teachers or communicates in a patronising manner (Heineke, 2013). The mechanism is to unite understanding. Experts can communicate the core components and rationale for the intervention to school staff. Their experience and knowledge bring credibility to the new practices and will therefore facilitate staff to unite around the practice and the values underpinning it. Staff feel more prepared to deliver with fidelity because they have received professional development from a knowledgeable, trusted source. The PD has taken place in their own setting, which is important to them feeling prepared to also deliver in this setting. Staff views about appropriateness and buy-in to the intervention are supported as staff feel adequately prepared, and the credibility of the new practice has been reinforced.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation strategy 38: Conduct Educational Outreach Visits.				
Have a trained person (i.e., person who has developed the intervention, received certified training in the practice, and/or extensive experience implementing the practice) meet with school personnel in their practice settings to educate them about new practices with the intent of changing the school personnel's practice.				
Context	Actor	Mechanism	Outcome	Evidence
Intervention features (someone knowledgeable about the intervention) and agents for change (relational aspect of the strategy is important, how well established intervention is affects availability of experts).	The expert.	Uniting (expert has an opportunity to add credibility to the new practice and communicate its core rationale and practices, therefore uniting knowledge).	Buy-in Fidelity Sustainability	Goldstein, 2015; Bingham, 2018; Alonge, 2020; Austin et al., 2011; Guhn, 2009; Brock and Carter, 2017; Owens et al., 2019; Walker et al., 2022; Monzalve and Horner, 2021; Nunes et al., 2018.
CERQual confidence rating: Moderate				

Summary

A range of evidence from reviews to empirical qualitative research supports the impact of professional development delivered by a credible source with good knowledge of the intervention. This impacts on buy-in, fidelity, and sustainability. There are some facilitators in terms of flexibility and time available which are addressed by other strategies. As such, the strategy needs to be considered alongside other professional development strategies rather than in isolation and therefore the coherence of this finding in isolation is limited. Therefore, this ICAMO is rated as a moderate level of confidence.

45. Shadow other experts

SISTER Strategy 45, ‘shadow other experts’, is categorised by Cook et al. (2019) as a strategy to train and educate stakeholders. It is described as providing ways for key individuals to directly observe experienced people engage with or use new interventions. We assume that unlike outreach visits where an expert comes to the school to deliver PD, here some staff will often visit experts in other settings to observe and learn about the intervention being used in practice.

Definitions in the literature

Shadowing is rarely used as a term for this kind of strategy in the school-based literature aside from those studies that draw upon the SISTER strategies or previous broader ERIC implementation strategy taxonomy. However, evidence shows that there is a distinction between professional development related to this strategy and others in which either an expert is instructing and aiming to increase understanding in those who will deliver an intervention or supervision and coaching which provides feedback to those school staff as they are using the intervention. The evidence does not exclusively relate to visits to other schools to see more developed practice. At times it can involve experts, coaches, or intervention developers demonstrating the intervention in the school context in which it is to be delivered. Therefore, shadowing other experts often includes both visiting other schools (e.g. Walker et al., 2022) and experts modelling intervention delivery in the relevant school context (Phillips et al., 2017).

To what extent does the evidence indicate outcomes?

There is evidence that shadowing other experts can improve fidelity, adoption, including buy-in, the time it may take to prepare for implementation, and pupil outcomes. However, more often interventions use this strategy alongside other professional development, so it is not clear the impact that shadowing other experts has alone. There is also relatively little evidence focused on this strategy compared to other professional development strategies considered above. Shadowing other experts can have associated benefits such as collaboration between schools.

As for training being delivered, the EEF-funded Professional Development Evidence Review suggests that shadowing other experts as a form of effective PD would involve the provision of information from a credible source, including having an expert teacher to promote the practice (mechanism 4). This evidence suggests that participants are more motivated to use and adopt a new practice if they find the information to be credible and therefore being able to shadow others with experience and expertise delivering an intervention will increase credibility (Sims et al., 2021).

More specific to shadowing experts are two other mechanisms from Sims et al.'s (2021) review. Mechanism 8 of the PD review, 'modelling the technique', is also a way to develop teaching techniques. This recommends that PD gives opportunities to reflect, observe, and imitate an observable sample of practice. This gives teachers the chance to learn solutions to problems in advance of their own practice. Mechanism 14, 'prompting context-specific repetition' involves teachers rehearsing and repeating practices in the same context as they would usually be delivered (i.e. in their classroom). It suggests that it is important for teachers to be familiar with how to deliver the practice in their setting. This mechanism focuses on prompts so that the context elicits behaviour and therefore suggests shadowing intervention practice delivered by an expert in the context for the new intervention may help build consistent practice (Sims et al., 2021).

Walker et al. (2022) conducted a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. This study reported that offsite training where one to three staff members learnt about a specific active learning approach was highly valued by participants. This appeared to impact buy-in as well as providing staff with skills to deliver the intervention that could be shared with colleagues.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. Shadowing other experts was one of 37 implementation strategies used by stakeholders; specifically, school co-facilitators and community mentors observed group leaders model programme delivery to learn programme content. This meant the dose of this strategy relative to others was high as it was used during each group session. Authors report that the use of the strategy targeted sustainability, fidelity, and acceptability, although the impact on these outcomes could not be isolated.

Phillips et al. (2017) investigated the teacher characteristics that predicted fidelity to a vocabulary and language curriculum intervention in preschool classrooms. Although the study was included because it shows that teacher preparedness and classroom management predicted fidelity, it also featured researchers modelling strategies as part of the intervention, videos of intervention lessons, and mentoring sessions that included modelling. This shadowing of experts (researchers who developed the programme) may partly explain the overall high level of fidelity reported.

McBride et al. (2002) explored fidelity in a longitudinal study about the implementation of a drug education programme in secondary schools. The focus of all professional training received by teachers participating was interactive modelling. This meant teachers both saw the activities be modelled but acted as pseudo students themselves. The authors argue that this aided fidelity as it meant teachers reflected after each modelled activity about how they would put in place the activity in their classrooms. This was argued to provide a model against which teachers could then compare and consider their own teaching, including on their level of fidelity.

A review by Desimone (2002) of Comprehensive School Reform Models found evidence that slow or weak implementation was associated with a lack of professional development that provides both knowledge and examples of exactly what the reform looks like in practice. Teachers across studies requested more specific examples of instructional practices that demonstrated the reform and availability of established schools where teachers could observe the

programme. Being able to shadow the practice in other schools held the benefit of offering technical assistance to schools new to the programme.

However, Lyon et al. (2019) report that this strategy may not be as impactful as other professional development strategies in the SISTER taxonomy. They surveyed 200 school-based consultants who support social, emotional, and mental health services; participants considered 'shadow other experts' as a relatively unimportant strategy and only moderately feasible. This may partly explain the relatively small amount of specific evidence we found in relation to the strategy and some of the barriers reported below.

A range of other studies included elsewhere in our analysis show that opportunities to shadow an intervention in other schools are commonplace as part of professional development for interventions (Balfanz et al., 2006; Bodilly et al., 1996; Doyle and Huinker, 1999; Fenton, 2002; Miedjensky and Abramovich, 2019; Sider, 2019; West et al., 2017). However, these studies do not let us know whether shadowing other experts has an impact on outcomes beyond other common elements of professional development like educational outreach visits happening in schools and ongoing training.

In summary, two reviews, two quantitative studies, one mixed-methods study, and two qualitative studies demonstrate beneficial impact of shadowing other experts on outcomes that include fidelity, adoption, and pupil outcomes. While there is good evidence that seeing an experienced user of an intervention model practice can impact fidelity, often intervention studies use this strategy alongside other professional development, so it is not clear the impact that shadowing other experts has alone. Shadowing other experts can have associated benefits such as collaboration between schools.

What does the evidence tell us about the situations in which schools might use this strategy?

We assumed that shadowing experts would be used exclusively as professional development to inform key school staff about the intervention that they could then share with colleagues and plan how the intervention would be comparably delivered in their own school context. However, a few studies showed that shadowing other experts happened in other situations potentially to provide potential interventions, or later to see practice to help sustain the intervention.

A mixed-methods case study conducted by Miedijensky et al. (2018) examined the process of educational change as demonstrated in three Israeli elementary schools implementing education for sustainability (EfS). A recommendation for improving implementation was visit other schools to observe practice. However, this was more open to considering intervention options rather than only to learn about delivery of a selected intervention.

Balfanz et al. (2006), who analysed the impact on pupil outcomes of four years of maths education reforms in U.S. middle schools, describe school personnel shadowing curriculum coaches as one of many features that may explain the beneficial pupil outcomes compared to control schools. Notably, shadowing here came in year three of the study and was not therefore about initial understanding of the practice but about helping schools to sustain the reform over time. Those who shadowed were equipped to deliver training and support implementation in their schools.

Bodilly et al. (1996) evaluated a range of whole-school reforms using a comparative case study approach. A different example of observing other schools' practice was in the use of critical friends visiting other schools using the same reform programme to provide feedback. Where this was used, it was reported to benefit the critical friend observing as this encouraged them to better understand the purpose of the intervention and access examples of good practice to take to their own schools.

What does the evidence tell us about how the strategy works well?

There is some evidence that shadowing experts increases confidence. Goldstein and Olsewski (2015) use the exploration, preparation, implementation, sustainment framework to identify factors relevant to the development and implementation of a supplemental early literacy curriculum. In part because the intervention was being designed and piloted by researchers it meant that many teachers participating saw the intervention being delivered by the research team with their students. Many teachers reported that this raised their confidence in their ability to implement what they had observed, therefore indicating increased acceptability. However, some teachers still reported lower acceptability as they did not wish to add the new curriculum to their existing practice. This suggests that a certain amount of buy-in is needed in advance of shadowing an intervention.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Barriers to shadowing other experts include the associated resources to facilitate visits to other schools or time for staff to observe practice outside of their classroom. This may help to explain the feasibility ratings reported by Lyon et al. (2019) above. McHale et al. (2022) aimed to identify barriers and facilitators to implementing a whole-school physical activity intervention in secondary schools in Ireland. One of a range of barriers was a lack of collaboration and therefore researchers suggested that a strategy that ought to be used as part of the programme is creating links between schools at different stages to enable schools more experienced in the intervention to provide advice to schools about to put it

into practice, including opportunities to observe the intervention. This collaboration between schools is hypothesised to lead to sharing of experiences and ideas as well as supportive relationships.

In their EEF evaluation of Challenge the Gap, a school collaboration programme, West et al. (2017) unsurprisingly found that participating teachers often valued visiting other schools and the professional development associated with that, however, time to do this was perceived as a barrier. A similar barrier was reported by Reis et al. (2010) in their report of case studies of whole-school reading implementation in U.S. elementary and middle schools. Here the barrier was budget to cover teaching.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts are all relevant to shadowing experts. *Intervention features* will partly dictate how feasible it is to observe delivery that can be reproduced in staff's own school context. There would be interventions that are complex or flexible in delivery where the strategy may not be as appropriate (Desimone, 2002). As indicated in the evidence discussed above, *enabling structures* in terms of resource and support is a necessary condition for this strategy (McHale et al., 2022; West et al., 2017). However, the expert being shadowed is key; as an *agent for change*, their expertise and credibility is necessary but not sufficient for the strategy to be effective (Phillips et al., 2017). Shadowing an expert demonstrating the intervention will *unite* understanding of the intervention as other professional development strategies would. However, what distinguishes this strategy from the other PD strategies where uniting understanding is clearly the mechanism driving outcomes, is the opportunities for *reflecting* on the intervention and the fit with staff's own school context (McBride et al., 2002). Hence this mechanism is seen in the ICAMO configuration below indicating the interaction between agents for change and reflection impacting fidelity, acceptability, and sustainability.

ICAMO configuration for shadow other experts

This strategy reveals a context in which agents for change are empowering and upskilling others to then become agents for change themselves later. The expert being shadowed needs to be informed and experienced in the intervention but also needs to be able to demonstrate the benefit of the intervention or it modelled with fidelity to core components. Therefore, the expert is a key contextual factor. This strategy also provides the context for the observing school staff member to themselves become an agent for change, most likely by sharing their knowledge and understanding later with colleagues. The key actor in this strategy is the expert/s and the individual/s who can observe the expert. The observer ought to be carefully selected and may be an implementation team member or champion who can relay the information to others. Seeing an expert use a new practice provides a model against which trainees can reflect on their own practice, that of colleagues, and any differences between the school contexts. Reflection may occur through conversation between the expert and the observer as well as by the observer and colleagues. Observing an expert will give clear expectations for practice, often tangible ongoing support. There will be increased buy-in and acceptability in relation to the intervention, particularly for colleagues when observations are relayed. Through seeing an expert model the intervention and reflecting on this, fidelity is likely to be improved. When the shadowing may occur over the longer-term this can aid sustainability.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 45: Shadow other experts				
Provide ways for key individuals to directly observe experienced people engage with or use new practices.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change (learning from experts and building own expertise).	The expert and the person observing, although colleagues will be impacted.	Reflection (critically consider how the intervention is used in practice in relation to own school setting, discussions (often ongoing) with expert).	Buy-in Acceptability Fidelity Sustainability Pupil outcomes	McBride et al. 2002; Sims et al., 2021; Walker et al., 2022; Moore et al., 2021; Phillips et al., 2017; Bodilly et al., 1996
CERQual confidence rating: Low				

Summary

Some evidence from reviews to qualitative research supports the impact of professional development that involves shadowing an expert using the intervention in practice. This impacts on buy-in, acceptability, fidelity, and sustainability. While these outcomes are likely to also be caused by improved knowledge (uniting understanding), shadowing experts allows for reflection about the fit of the intervention with the target school setting and current practice and the potential for ongoing support from those with experience in practice. There are some barriers in terms of resources needed to facilitate this strategy and it is rare that this strategy is used as the only professional development, therefore there are concerns about the adequacy of the evidence and the ICAMO is rated as a low level of confidence.

46. Use train-the-trainer strategies

SISTER Strategy 46, 'use train-the-trainer strategies', is defined by Cook et al. (2019) as 'train designated school staff to train colleagues in new interventions'. It is categorised as a strategy to train and educate stakeholders.

Definitions in the literature

Train-the-trainer is also known as 'cascade training' and typically sees one member of school staff receive training designed to allow them to then run professional development sessions with staff in their school (Cane and Oland, 2015). In response to some of the potential limitations, some studies recognise that several staff may receive training and that the professional development is likely to be more intensive if the goal is not just to acquire knowledge but gain ideas about how to communicate this with staff in teacher's own school context (Walker et al., 2022).

To what extent does the evidence indicate outcomes?

There is evidence that train-the-trainer can improve adoption, sustainability, and increase knowledge about the intervention. However, there is a paucity of school-based studies focusing on outcomes.

Walker et al. (2022) conducted a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. This study reported that schools used train-the-trainer models where one to three staff members received offsite training and then brought back skills and information to both inform adoption decisions and cascade training to other staff. It was unclear the impact in terms of the reach of the training, barriers were recognised in terms of attendance at training delivered in the school when it was not mandated by school leaders. This implies that staff need support to put in place their train-the-trainer professional development.

Blaine et al. (2017) provide evidence that train-the-trainer models, when used in a flexible way to address arising training needs and train new staff, can impact the sustainability of interventions. They used mixed-methods to investigate implementation outcomes for a childhood obesity prevention intervention in a low income U.S. school district. Findings showed that wellness champions were able to train and motivate busy teachers to adopt the intervention. Teachers sustaining the intervention after a year had this wellness champion available for formal and informal training. This also mitigated against the barrier of staff turnover.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services, participants considered train-the-trainer professional development as both important and feasible.

There is a lack of studies assessing the impact of train-the-trainer approaches used in school settings. A systematic review of this type of professional development by Pearce et al. (2012) located no school studies. In research from broader health-related fields, train-the-trainer professional development is shown to increase knowledge, translate to practice, and improve patient outcomes in the majority of studies.

In summary, few studies—only one quantitative study, one mixed-methods study, and one qualitative study—demonstrate some beneficial impact of train-the-trainer organised professional development on a small range of implementation outcomes including adoption and sustainability. The evidence reviewed suggests beneficial outcomes when attendance at training is encouraged and therefore the internal trainers are supported.

What does the evidence tell us about the situations in which schools might use this strategy?

Train the trainer professional development is suggested to be most appropriate when interventions are structured and well resourced. Gee et al. (2021) systematically review the factors influencing the successful implementation of mental health interventions delivered in schools and colleges for young people with symptoms of emotional disorders. Understandably, more intensive training and supervision is likely to be required for these types of interventions yet many of the interventions involved training school-based staff to deliver a manualised programme. School staff are evidenced as being able to deliver these interventions with acceptable fidelity. Therefore, it is important that well-structured and highly manualised interventions are used when external training and facilitation is not available over time and train-the-trainer is considered.

What does the evidence tell us about how the strategy works well?

Cane and Oland (2015) report on focus groups conducted with schools who took part in the Targeting Mental Health in Schools (TaMHS) initiative in one English local authority. All four schools evidenced the need to cascade training to other staff members, however, only two had existing mechanisms to facilitate this. Time for training was also perceived to be a barrier across schools.

Alonge et al. (2020) describe a collaborative process for developing pathways used across countries for large scale implementation of school mental health programmes. The processes were based on theory of change workshops and feedback from a range of participants including policymakers, programme managers, mental health practitioners, and academics. They show a model where train-the-trainer starts at the national level and those trained then train district staff who deliver training in schools.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Kisa and Correnti (2015) surveyed over 1,500 teachers implementing America's Choice, a comprehensive school reform programme. They investigated why the 31 schools varied in their implementation of professional development despite implementing the same reform model. Their findings show the importance of measuring the fidelity of PD itself when train-the-trainer is being used and that there is likely to be greater variety in the train-the-trainer delivery when the intervention is complex.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts of *enabling structures* and *agents for change* are relevant. Barriers to train-the-trainer models were seen where staff charged with running these sessions either were not confident, did not prioritise it or did not have support in setting up training sessions where attendance was mandated. Because of this the evidence suggests that the enabling structures necessary to support train the trainer may be more important than the individual delivering the training, particularly as expertise and credibility is considered in other strategies. The mechanism *uniting* is relevant as the training can unite knowledge around the intervention and holds potential to ensure that knowledge is contextually relevant to the school. The trainer seeks to align knowledge of the intervention of recipients with their own, particularly if recipients may themselves be future trainers. It may be the case that the trainer, knowing the school context and colleagues, will be able to *engage* those being trained, although there was little evidence focused on this. Some evidence for adoption through train-the-trainer is seen. While the professional development should increase fidelity and reach given the potential to roll out training to more staff over time. However, evidence about these specific outcomes is limited.

Our realist synthesis indicated the interaction of enabling structures and uniting impacting adoption and other implementation outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for train-the-trainer

The impact of this strategy is affected by the enabling structures context. For it to be most effective, staff who are directly trained should be adequately supported to disseminate the training throughout the school environment. Schools may consider any material resources, time, or support from colleagues or programme developers which is required in order to train other staff members with fidelity to the developers intervention training. The individual who is designated to attend training is a key actor in this strategy as they require support to train other staff members. This support may be arranged mostly by the implementation team or senior leader. When the actor is supported with the train-the-trainer strategy in this way, it is an opportunity for the implementation team/senior leadership to demonstrate that implementation will be a collective responsibility (a value to underpin the implementation process). It is also an opportunity for knowledge and values underlying the intervention to reach wider staff groups and target the importance of the intervention for the school needs. Train-the-trainer strategies can help to diffuse knowledge throughout a school system and therefore prepare wider staff groups and build buy-in and initial adoption. If directly trained staff are not adequately supported to deliver their own training to wider staff groups, then the strategy may be associated with lower fidelity compared to all staff receiving training directly.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 46: Use train-the-trainer strategies

Train designated school personnel to train others in new practices.

Context	Actor	Mechanism	Outcome	Evidence
Enabling structures (Strategy is affected by how well supported staff are in creating an effective train the trainer system).	Staff who will be the trainer; implementation leaders who will facilitate this system; and trainees.	Uniting (communicating key knowledge and values underlying the change and its fit for the school to wider staff groups).	Adoption, Diffusion, Fidelity.	Walker et al., 2022; Blaine et al., 2017; Cane and Oland, 2015; Kisa and Correnti, 2015; Alonge et al., 2020.
CERQual confidence rating: Low				

Summary

Limited evidence for the impact of train-the-trainer strategies in school settings was located; this presents a concern in relation to the adequacy of the evidence that has been located for this ICAMO. Evidence shows that there can be barriers to establishing a system for train-the-trainer to operate as an approach and therefore an enabling structure and support from school leaders is necessary. Train-the-trainer focuses on transfer of knowledge about the intervention from the current trainer to potential future trainers. While the evidence for the context and mechanism is clear, due to the lack of available evidence the ICAMO confidence rating is therefore low. Train-the-trainer is likely to be more relevant when an existing training package is available that can be cascaded to school staff and then onto their colleagues. This implies developed training resources and interventions that are not too specialist or technical. Finally, train-the-trainer implies the need for monitoring about the professional development itself, to ensure that it is delivered in a way that respects the core components of the training.

41. Develop educational materials; 42. Distribute educational materials

SISTER Strategy 41, 'develop educational materials', and Strategy 42, 'distribute educational materials', are defined as 'develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about new practices and for school staff to learn how to deliver the new practices with fidelity'. Then these educational materials should be distributed by hard copy or electronically. Both are categorised under 'train and educate stakeholders'. Given that we assume distribution would understandably follow immediately after development of these materials we have considered these two strategies together. We have not analysed strategy 52, Pre-Correction Prior to Implementation, as a separate strategy as we assume that it largely serves the same purpose as these strategies or Strategy 53, 'remind school personnel', which we have analysed.

To what extent does the evidence indicate outcomes?

There is some evidence ranging from systematic reviews to small scale studies that educational materials can improve adoption and fidelity. This tends to relate to the goal of the materials though. When building knowledge through PD, the EEF review recommends managing cognitive load (mechanism 1) (Sims et al., 2021). The goal should be to avoid overloading participants with too much information and instead build knowledge incrementally. The review suggests this can be achieved by removing less relevant content, combining verbal and visual instruction and varying the presentation of information. This implies the importance of materials that help summarise and reinforce key messages.

Mechanism 11 within the EEF PD review suggests that PD programmes should provide prompts and cues to effectively embed new practices and support continued change to teacher behaviour. This can include a PD trainer delivering a fortnightly email or phone call to remind teacher to embed the new practices they have learnt. A prompt or cue can be a short summary or research paper or example for teachers to refer to.

Livet et al. (2018) completed a mixed-methods study with providers in U.S. elementary schools who had implemented one of three mental health interventions. All three interventions were provided on an online platform which gives access to four implementation strategies: intervention resources, online professional development, technical assistance, real-time fidelity data, and student progress monitoring tools. This shows how dedicated monitoring systems may be part of intervention resources. Providers 'agreed' that the intervention resources were valuable. Perceived value of the resources were not related to fidelity or pupil outcomes but was related to student engagement.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. As part of the intervention, culturally appropriate training and intervention materials, including the curriculum, were developed. Student activity books and family and student project information sheets were also created. These resources were

created by the research team but suggest that resources may at least need adapting to fit a school's context. All these materials were distributed, with students receiving all their resources together in a binder. This study links the development and distribution of materials with fidelity, penetration, acceptability, and sustainability. Sustainability relates to resources that are designed for the intervention and can thus be used over time if they are acceptable and have reach.

Chen et al. (2018) evaluated the feasibility of an implementation framework to increase the capacity of U.S. school leaders to implement a childhood obesity prevention programme in their schools. A range of quantitative measures were used to measure fidelity, changes to the school environment and student acceptability. Fidelity was relatively high, although student engagement varied over time. Resources were provided that included promotional materials for schools to promote awareness and posters to reinforce lessons. Although these strategies were not considered in relation to outcomes and schools chose whether to use these materials, it shows how resources may raise awareness or supplement intervention targets, rather than be a part of the intervention and only target fidelity.

Calvert et al. (2020) evaluated the resources available as part of adoption-ready, classroom-based physical activity interventions in a systematic review. They were interested in the extent to which resources addressed theory based implementation contextual factors. Overall, the researchers conclude that intervention materials were not deliberately targeting a range of implementation support. Facilitators to using the materials, and therefore adopting interventions, were reported to be when resources were supplied with the intervention, aesthetically appealing, and easy to use.

Resources provided as part of an intervention can help acceptability and adoption. Austin et al. (2011) sought to identify barriers and facilitators to adopting a school-based physical activity intervention. In interviews they found that facilitators to implementing the intervention were most often reported to be external support. Interviews further reported that this external support related to the quality of resources. This credibility of the support available was linked to fidelity and sustaining the intervention after a year.

Monzalve and Horner (2021) conducted a multiple baseline experimental design with four participants focused on improving the contextual fit of behaviour support plans and assessing impact on fidelity and target pupil behaviour. One of six core components of the intervention was making sure teachers have the resources needed to deliver the behaviour support plans. After use of the intervention, fidelity increased and pupil problem behaviour decreased, although this may not be due to the resources in isolation.

In summary, two reviews, two quantitative studies, one mixed-methods study, and two qualitative studies demonstrate beneficial impact of using educational materials on outcomes that include adoption, fidelity, and sustainability. The evidence reviewed provides multiple studies indicating impact on each outcome. However, the focus of the educational materials often tends to be on encouraging 'deliver with fidelity' or tools for implementers to monitor their delivery.

What does the evidence tell us about the situations in which schools might use this strategy?

Phillips et al. (2020) in their evaluation of fidelity to a software based tutoring system found that participants were positive about the support they received from intervention staff. However, the resources that staff directed teachers to in relation to implementation strategies did not help with designing models or integrating the tutoring system with the regular mathematics curriculum. Most teachers did not use intervention resources and used regular classroom resources to differentiate their practice. This indicates the importance of using this strategy when materials need to be used and considering existing materials that should be replaced.

What does the evidence tell us about how the strategy works well?

Lane et al. (2022) analysed data collected from a mixed-methods trial of a physical activity intervention in Australian Primary Schools. The PACE intervention includes eight implementation strategies including three types of resources: educational materials, success stories, and an equipment pack. Quality and usefulness of resources was an implementation facilitator. The use of the resources differed across schools depending on need. The implication is the need to make clear where resources are optional to support or related to core components of an intervention. If schools are developing resources themselves, they need to be sure that there is a need. The authors argue that the resource availability alongside other strategies like consultation, planning, and effective champions impacted fidelity to the intervention.

Leeman et al. (2018) evaluated how staff working nationally, in school district offices, and in local schools used several tools to help support the integration of health interventions in schools. Interview data shows how it may not be researchers but district staff who can help adapt tools for school staff to use; they reported selecting and extracting the information and guidance they viewed as best fitting a school's needs and making sure it was user friendly.

While much of the evidence suggests the benefits of existing educational materials and resources, Lord et al. (2017) found, in their evaluation of Literacy Octopus, that teachers created and collated resources themselves. This was not considered to be a substantial time burden as it was considered to be part of their normal teaching role.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Educational materials that offer reminders may be helpful, while inadequate resources may impact motivation of those delivering an intervention. Dariotis et al. (2017) interviewed both pupils and classroom teachers about their perspectives regarding a 16 week mindfulness and yoga programme running in their elementary schools. Programme delivery factors included barriers around resources. While this and other evidence suggests that educational materials and reminders (SISTER strategy 53) may be similar, teachers recognised that materials available in the classroom such as posters would be a helpful reminder of programme techniques. Some teachers reported that they would also value an abbreviated curriculum.

Bingham et al. (2018) conducted a collective case study and document challenges that occur in schools implementing technology-mediated personalised learning. Alongside the impact of not including professional development from an expert, administrators and teachers expressed concerns about the support teachers received. Evidence suggested that inadequate resources could affect teacher morale.

What does our realist review show are relevant contexts and mechanisms?

Educational materials and intervention resources are an important *intervention feature*. Our programme theory context of *intervention features* is therefore relevant to the strategies about educational material as research shows that sometimes these materials are not developed in school but are available from intervention developers. Educational materials can *unite* knowledge if they are useful to school staff. Materials that might prompt teachers to consider their practice may help them to *reflect* on their delivery, including on core components.

Our realist synthesis indicated the interaction of *intervention features* and *uniting knowledge* impacting adoption and fidelity amongst other outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for educational materials

The strategies 'develop educational materials' and 'distribute educational materials' are influenced by the intervention features. The extent to which materials are tailored to the needs and circumstances of the school will affect how accessible and useable they are. The resources can communicate or offer clear reminders about the core components of a strategy and are a way for staff to become familiar with the intervention and gain clarity of procedures and content. Intervention developers are key actors for the development of educational materials. Where they have a role in the development of educational materials, schools do not have this burden but can focus on adapting the materials to their context. The distribution of materials may be by developers/trainers initially, and implementation teams or champions at the school level. Distributing materials can be an opportunity to communicate or remind about the values driving change and the intervention more specifically e.g. the ethos and principles underlying the new approach. The materials are a resource that can be referred to for consistent definitions, examples, and practices for all staff implementing. The strategy therefore prompts a unified approach to implementation. If there is clear communication of what implementation will entail, staff will feel more prepared to implement. This will contribute to wider staff buy-in and commitment to implementation. Interventions which provide the school with materials may also encourage schools to adopt a programme, and support their fidelity during implementation.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 41: Develop educational materials; Strategy 42: Distribute educational materials				
Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about new practices and for school personnel to learn how to deliver the new practices with fidelity.				
Distribute educational materials (including guidelines, manuals, and toolkits) in person, by mail, and/or electronically.				
<u>C</u> ontext	<u>A</u> ctor	<u>M</u> echanism	<u>O</u> utcome	<u>E</u> vidence

Intervention features (fit of materials to the school, resource accessibility and procedural clarity).	Intervention developers, trainers, implementation team or champion.	Uniting knowledge (foundation for consistent understanding, communicating ethos and principles of approach).	Fidelity Adoption Buy-in /commitment	Bonnell, 2015; Mills and Stephens, 1992; Evans, 2015; Livet, 2018; Moore, 2021; Chen, 2018; Calvert, 2020; Dariotis, 2017; Lord, 2017.
CERQual confidence rating: Low				

Summary

Evidence suggests that quality resources may have an impact on adoption and fidelity, although this was not always beneficial across research studies or the impact shown in isolation. It is also hard to distinguish educational materials from intervention resources and reminders about an intervention. Research tended to be more focused on resource availability and format rather than schools developing or distributing the resources as implied by the strategies. As such, the adequacy and coherence of this review finding has some concerns and the ICAMO is therefore rated low. Given the evidence that there may be barriers to schools creating their own intervention resources, intervention features, in terms of resource availability and quality, is important to consider when exploring implementation.

51. Improve implementers buy-in

SISTER strategy 51, Improve Implementers' Buy-In, is categorised by Cook et al. (2019) as a strategy which falls under 'support educators'. It is indicated as efforts to engage school personnel in activities or discussions that attempt to increase their buy-in and motivation to adopt and use a new intervention.

Definitions in the literature

Buy-in tends to relate to psychological agreement with a change; it can be seen as an alignment between individual beliefs, the goals of a new intervention, and feelings of competence in relation to an individual's role in implementation (Briggs et al., 2018). Improving buy-in is often indicated as being tied to implementer self-efficacy, motivation, and beliefs about a new intervention (Dare et al., 2018; Silva et al., 2021), their own professional roles and responsibilities (Dyssegaard et al., 2017; Martinez., 2016), and the extent to which they perceive themselves as having the capacity to absorb change (Bohanon et al., 2012; Roach et al., 2009; Trapani et al., 2018).

To what extent does the evidence indicate outcomes?

Our review of the literature located a range of quantitative, qualitative, and mixed-methods studies that show the beneficial impact for schools of undertaking activities which aim to improve implementer buy-in on outcomes including adoption, acceptability, motivation, fidelity, and sustainability. The evidence does indicate that buy-in has been targeted in many ways.

Cook et al. (2015) conducted a quantitative study where they assessed the impact of professional development that both sought to inform teachers about a whole-school behaviour intervention and improve their beliefs and attitudes towards the intervention. Educator beliefs significantly improved after training and this change was associated with indicators of implementation fidelity. This shows that buy-in can be improved through professional development and its link to fidelity as an outcome. This shows the most direct impact of a strategy to improve buy-in.

Improved buy-in has also been associated with adoption. Lohrmann et al. (2008) conducted a qualitative study with practitioners who provide schools assistance when implementing school-wide positive behaviour support seeking to identify and understand barriers to school staff adoption of the intervention. They reported that a way to improve staff buy-in was providing evidence of it being effective in other schools. This was argued to improve adoption as an outcome alongside other strategies.

Gregory et al. (2021) conducted qualitative interviews with practitioners using restorative practices as a behavioural approach in U.S. schools. The study aimed to identify components of implementation that supported building infrastructure, increasing staff and student capacity, and putting in place different levels of support. Participants indicated that buy-in was high when the intervention was part of the fabric of the school and therefore buy-in was from the whole school. Some strategies for fostering this included regular participation in the intervention, celebrating small steps, and sharing values.

Brann et al. (2021) used a mixed-methods case study design to identify implementation determinants and strategies related to implementation reach of universal screening for mental health difficulties in two U.S. private schools. Outreach

was reported as a strategy used to build buy-in across a range of groups including parents and teachers, it involved educating about the intervention. Teacher buy-in was identified as a barrier to implementation, although this could be addressed through the availability of ongoing assistance which may improve fidelity.

Loman et al. (2010) evaluated variables associated with sustainability of First Step to Success, a targeted intervention for young students at risk of behavioural disorders across 29 U.S. elementary schools. Sustainability was measured using an existing measure related to the sustained use of the intervention. Their findings showed that nearly two thirds of non-sustaining schools identified staff buy-in and support to the intervention as critical to sustained implementation. This indicates the importance of buy-in to sustaining an intervention.

Malloy et al. (2015) evaluated the influence of teachers' ratings of school climate on fidelity of Positive Action, a socio-emotional and character development programme in 18 elementary and middle schools. They found that attitudes towards the intervention were related to readiness and adoption.

Monzalve and Horner (2021) conducted a multiple baseline experimental design with four participants focused on improving the contextual fit of behaviour support plans and assessing impact on fidelity and target pupil behaviour. One of six core components of the intervention was making sure intervention procedures were consistent with teachers' values. After use of the intervention, fidelity increased and pupil problem behaviour decreased, although this may not be due to the efforts to increase buy-in in isolation.

Bohanon et al. (2012) evaluated the implementation of a positive behaviour support approach in a U.S. high school through a case study design which utilised descriptive analysis and a change point test for continuous variables to help to identify changes in fidelity of implementation over time. The study found that practitioners were less likely to become frustrated with implementation if they did not perceive new processes as additional responsibilities added to an already overcrowded workload. Furthermore, like Lohrmann et al., they found drawing on richly detailed examples of practice from previous implementation efforts, particularly those with learning points to reflect on, was indicated to have 'decreased the amount of time needed for preparation and developing buy-in' (p. 100).

Perceived impact on pupil learning and development is also linked to buy-in and greater degrees of fidelity. In a qualitative case study exploring stakeholder views of curriculum-based outdoor learning across three primary schools in Wales, Marchant et al. (2019) describe how noticing a variety of perceived benefits to pupils helped to improve buy-in over time for implementers.

Similarly, buy-in from parents was found to increase the likelihood of longer-term sustainability of an approach. In an evaluative report of the Pennsylvania Pre-K Counts Programme in the U.S., researchers found that implementers valued the role of parents as 'first teacher to their child' and therefore placed emphasis on involving and engaging parents in implementation efforts to develop a more comprehensive approach (Peisner-Feinberg et al., 2020).

In summary, there is a good range evidence available, including five quantitative studies and isolated mixed-methods and qualitative studies, which demonstrates the beneficial impact of improving implementers buy-in over time using a range of activities and discussions. This evidence is of mixed quality and situated predominantly in the U.S. context. The evidence is linked to outcomes including adoption, acceptability, feasibility, fidelity, pupil outcomes, and sustaining an intervention. Buy-in can be generated through a range of different activities including needs assessments, professional development, and learning from previous implementation. With some exceptions (see Bohanon and Wu, 2014; Cook et al., 2015) most studies so far have not explicitly examined buy-in through their research questions and study design, with most describing buy-in as a facilitator or barrier when evaluating the implementation of a school-based intervention.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that improving implementer buy-in is utilised when implementing a wide range of prevention and intervention approaches in schools, from changes at a whole-school level (Durand et al., 2016) versus targeted and individualised interventions (Trapani and Annunziato, 2018). There is evidence that buy-in is a factor recognised as a both a facilitator and barrier for schools when implementing evidence-based practice including health-related approaches (Han and Weiss, 2005), behaviour management (Bohanon et al., 2012), as well as learning (Marchant et al., 2019).

Evidence suggests that improving buy-in is particularly valuable when implementing approaches which may be considered controversial or emotive, for example in the context of sex and relationships or drug and alcohol misuse (Pearson et al., 2015; Tancred et al., 2018; Sadjadi et al., 2021). For instance, Leung et al. (2020) discusses the barriers and facilitators in implementing a school-based referral system for sexual health services in the U.S. context. The qualitative study interviewed 19 adult stakeholders involved in implementation and undertook analysis using the Framework method. Leadership engagement was considered one of the key constructs which shaped implementation outcomes. When buy-in was perceived to be present among school leaders, staff viewed leaders as supportive, involved, and motivated, which in turn provided increased motivation among implementers. Conversely, when buy-in was perceived to be absent among school leaders, school-level champions were often difficult to locate and the acceptance and commitment of school leaders was perceived to be low. This was considered a barrier for

implementation with multiple flow-on effects including lower motivation and less engagement. A similar finding was reported by Humphrey et al. (2020) in relation to a whole-school improvement programme, where buy-in was reported to be needed across the school leadership team.

Furthermore, evidence suggests that buy-in linked to implementers' beliefs about, and capacity for, change ought to inform when to target implementer buy-in (Hall and Hord, 2001). One case study of implementer changes in behaviour in response to delivering an approach to improve Algebraic Thinking in U.S. elementary schools, found that degrees of concerns around perceived readiness, perceptions of an approach in relation to pupil need and belief in one's own professional skills played a role in shaping levels of use and fidelity during implementation (Tunks and Weller, 2009). Similarly, Trapani and Annunziato (2018), in their efficacy study of the Understanding by Design implementation in U.S. schools, infer that implementation leaders need to devise ways to anticipate and facilitate change at the individual level, which implies that the activities and discussions around buy-in need to explore individual evolving perspectives around needs and beliefs in order to help support implementers to re-evaluate and transform their practice in line with new evidence-based approaches. This links in with Strategy 1, 'assess for readiness', which similarly requires re-visiting along the implementation journey to establish how staff perceptions, needs, and experiences are evolving.

What does the evidence tell us about how the strategy works well?

As indicated above, there is a wide range of ways in which buy-in might be improved. Han and Weiss's evidence review (2005) explored literature on factors related to teachers' implementation of mental health prevention and intervention approaches and subsequently synthesised four ingredients that characterise more sustainable approaches. These ingredients were acceptability to teachers, programme effectiveness, feasibility of ongoing implementation with minimal but sufficient resources, and flexibility and adaptability. Buy-in resonates across these ingredients as each influences the perceptions and acceptability of a given approach. However, most resonate with the strategy implications of improving buy-in through activities and discussions is acceptability to teachers. Evidence suggests that teachers who have more self-efficacy 'invest greater effort in programme implementation, which in turn is more likely to lead to successful experiences with new strategies (if executed competently)' (p. 668). In evaluating the potential benefits of a programme and their interest in implementing it, teachers must perceive the programme as 'not only meeting the needs of their students but also complementing their teaching style' (p.672). Han and Weiss's synthesis suggests that teacher's buy-in is influenced by:

- school and district support for the programme;
- student needs;
- intervention procedures;
- the amount of time required to implement the intervention;
- the compatibility of the intervention with their own beliefs and practice; and
- the reported effectiveness of the intervention.

Evidence suggests that teachers' level of engagement and receptiveness to the above factors have been linked with acceptability and the likelihood of an approach being implemented with fidelity. Furthermore, attention to these factors across activities and discussions which seek to improve buy-in is important as implementation perceptions have been found to translate to implementation intentions (Han and Weiss, 2005). If teachers are engaged with activities and discussions around buy-in and associated concepts, motivation can be improved, which is linked with longer term sustainability of school-level mental health programmes.

Bridging, brokering, and buffering strategies, depicted in a mixed-method, multiple-case study of high performing elementary schools by Durand et al. (2016) as strategies which leaders take to 'develop connections (bridges) between external school partners, buffer stakeholders from external demands, and broker arrangements with other stakeholders in change initiatives' (p. 57) are linked to improving buy-in in several ways. These links include undertaking strategies aimed at building trust through communication, enabling, and encouraging implementers to use resources creatively, and adapting rather than adopting implementation. These strategies, in combination with others, were found to both enable, nurture, and protect implementer buy-in over time leading to greater degrees of acceptability, feasibility, and sustainability.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. This study shows how although schools independently reported on how they increased teacher buy-in, increased buy-in was related to a wide range of other strategies used including reminders, professional development, informal discussions, and championing the intervention. Similarly, Moore et al. (2021), who conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme, reported that buy-in from school staff was achieved using other strategies such as incentives, meetings, professional development, and ongoing communication about the intervention.

Through a keyword and snowball search, Greenhalgh and Papoutsi (2019) identified recent systematic reviews, narrative reviews, realist reviews, and theoretical syntheses on spread or scale-up of implementation. Although focused

on healthcare settings, the implications from this review hold relevance to the school setting, particularly as both can be considered complex adaptive systems. A learning education system, for example, would acknowledge the unpredictability of Implementer buy-in and therefore develop a range of activities and discussion to explore and improve buy-in iteratively throughout implementation. The three additional constructs added by Greenhalgh and Papoutsi—develop adaptive capability in staff, attend to human relationships, and harness conflict productively—are salient concepts to apply to improving buy-in as each recognise the environmental, social, and behavioural elements which shape buy-in over time. They may pose useful starting points in which to facilitate activities and discussions around buy-in and how it can be improved over time.

Humphrey et al. (2018) undertook a mixed-methods randomised controlled trial of the PATHS (promoting alternative thinking strategies) curriculum for promoting social and emotional wellbeing among children aged 7 to 9 years. Their qualitative analysis describes how perceptions of needs and benefits was linked to implementer buy-in. For example, PATHS was seen by many staff as filling an important void in current social and emotional learning provision as well as helping to extend and deepen teaching in comparison with established approaches due to being informed by the latest evidence around psychology. This relates with the 'adaptive capacity' construct (Greenhalgh and Papoutsi, 2019), which may be conducive to improving implementer buy-in over time.

The strategy focuses on implementer buy-in, often school staff in the evidence. However, a small amount of evidence recognises family and pupil buy-in as important to target too. Martinez et al. (2019) discuss the importance of student voice in relation to Positive Behaviour Intervention Support implementation in U.S. high schools. It outlines some strategies schools have used. The authors argue that using student voice increases student buy-in and this in turn leads to greater adoption and sustaining of interventions.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

In a review of evidence which examined two successful school reform programmes in the U.S., Guhn et al. (2009) identified processes associated to their success, with a focus on the implementation and sustainability of these programmes (2009). They found that when schools did not engage with activities and discussions which acknowledged the inherent needs of implementers to relate, to have autonomy, and to develop competence the absence of these factors could undermine social processes associated with implementation.

Sun et al.'s (2007) 'goal-pressure-support' framework developed from a review of the contextual factors present in school improvement across evidence from eight European countries found a link between the types, range, and frequency of communication between stakeholders and buy-in. Particularly, the more that schools were able to network and learn about each other's strategies, including what worked, what did not work, and why, helped to generate 'considerable power' among school staff who were found to be 'more motivated when cooperating with colleagues from other schools' (p. 117) compared with scenarios where networking opportunities were lacking.

Chong and Lee (2021) asked school leaders in Singapore schools to complete a SWOT analysis in relation to their use of prevention education programmes (typically social-emotional learning and character education). The analysis showed that the most significant challenge reported was obtaining teacher buy-in. They also reported that poor student buy-in further limited teacher buy-in. Collaboration between teachers was seen as a way of fostering buy-in.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold salience to developing implementer buy-in. *Enabling structures* that allow adequate time for communication, planning, and developing practice are all conducive to helping to foster buy-in. Moreover, if enabling structures hinder implementation efforts by making tasks more difficult or burdensome then structures become disempowering for school stakeholders. If structures do not change or evolve in response to needs, staff can become disillusioned and de-motivated, which decreases acceptability and feasibility (Massey et al, 2021). Implementer buy-in is also influenced by the nature of the improvement area. Buy-in may refer to the direction of practice more generally, for example, agreement around broad level objectives such as improving social capital or developing a culture of reading. However, buy-in can also refer to more specific intervention characteristics, for example, when implementing a particular phonics or maths accelerator programme whereby staff may express preferences for certain approaches over others. This implies that *intervention features* are also an influence on buy-in as staff preferences, prior experiences, and motivations are considered in response to the more granular level components of an approach and how it will be delivered with fidelity (Bingham et al., 2018).

However, the *agents for change* who are involved and engaged with implementation are key to the context of developing buy-in. Our realist synthesis indicated how agents for change, particularly school leaders, can trigger the mechanism of *engaging voices*, which is crucial to, firstly, understanding the nature of buy-in in relation to an approach and the structures in which an approach takes place (An et al, 2021; Grossi et al, 2019) and, secondly, to be meaningfully able to act on and address misconceptions, worries, or queries which may otherwise decrease buy-in, communications with key stakeholders such as teachers, parents and students need to be collaborative, reciprocal, and open so that stakeholders will feel a sense of ownership over decisions (Guhn, 2009). This will contribute to a positive school climate

where trusting and supportive relationships are evident, and where expectations and objectives are aligned. This impacts on coherence, fidelity, and sustainability as indicated in the ICAMO configuration below.

Other programme theory mechanisms are indicated to a lesser extent. Indicators of buy-in are linked to meaningful engagement with ideas, processes, and responses, therefore *reflection* is also implied (An et al, 2021). The importance of initial buy-in to an approach in preliminary stages of considering which evidence-based approach to take forward, implies that coherence and *uniting* around decisions also plays a role in generating buy-in (Guhn, 2009). Although as the strategy indicates improving rather than initiating buy-in, we infer that buy-in is also an evolving process which may ebb and flow in response to wider contextual factors, and it is through agents for change engaging voices that these changes can be identified, understood, and acted on.

ICAMO configuration for improve implementers' buy-in

When improving implementer buy-in, agents for change help to steer the activities and discussions which can help stakeholders to identify, understand, and act on the influencing factors of buy-in. Our analysis suggests that providing activities and discussion which can elicit implementer's perceptions, prior experiences, and motivations in relation to new practice can aid feasibility and acceptability. Those tasked with implementing change should be engaged in activities and discussion which explore and examine buy-in. Our realist analysis indicates that buy-in is not simply something that senior leaders assess: it is something that requires generating through careful and sensitive communication and inquiry between members of the implementation team, and then with parents, carers and pupils as implementation progresses. Engaging and involving the voices of implementers in practice-related decisions and development is part of generating buy-in. Meaningful engagement, which encourages connection and sharing experiences and ideas amongst teams, is required to improve buy-in. Implementer buy-in is associated with a range of flow-on effects including improving implementation outcomes such as fidelity, acceptability, feasibility, and sustainability.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation strategy 51: Improve Implementer's Buy-In.				
Engage school personnel in activities or discussions that attempt to increase their buy-in and motivation to adopt and use the new practice.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change , particularly school leaders, can facilitate open and reciprocal conversations around needs, the suitability of a given approach and other contextual factors. They can also select how buy-in can be increased given staff concerns and the intervention.	Implementation team and leaders may take more responsibility for planning how to improve buy-in. These activities affect the buy-in of implementation stakeholders.	Engaging and involving implementers in practice-related decisions and development is part of generating buy-in. Meaningful engagement, which encourages connection and sharing experiences and ideas amongst teams, is required to improve buy-in.	Improving implementers' buy-in helps improve the acceptability, feasibility, and the longer-term sustainability of an approach. Pupil outcomes.	Cook et al., 2015; Lohrmann et al., 2008; Brann et al., 2021; Bohanon et al., 2012; Tunks and Weller, 2009; Trapani and Annunziato, 2018; Sun et al, 2007; Guhn, 2009; Bingham, 2018; Grossi, 2019; Massey, 2021; An, 2021.
CERQual confidence rating: Moderate				

Summary

There is evidence that improving implementer buy-in is a beneficial strategy in isolation or in line with other related action. A good range of evidence indicates the benefit of using this implementation strategy. There are two issues in relation to the evidence that reduce confidence in both recommending the strategy and the ICAMO configuration

explaining how improving implementer buy-in is seen to work. Firstly, buy-in can be improved in a wide range of ways including often through the use of other strategies. Buy-in has been noted in analysis of other strategies as a beneficial outcome. Therefore, this strategy needs to inform the use of others. Secondly, no specific measures for buy-in were identified and a definition of buy-in is rarely given in studies. Therefore, it is not always clear what is being targeted and when buy-in has improved.

Our realist review analysis shows how agents for change involve and engage stakeholders in the activities and discussions which generate buy-in. The ICAMO configuration for improving implementer buy-in is currently rated as a moderate level of confidence due to concerns about the coherence of findings specifying how buy-in should be improved, as well as an absence of measures to assess buy-in.

6. Develop and organise quality monitoring systems

Strategy 6 in the SISTER compilation, 'develop and organise quality monitoring systems', is classified as an evaluative and iterative strategy (Cook et al., 2019). The focus is on both systems and procedures used to monitor the impact of introducing a new intervention into school practice in terms of quality assurance (which is presumably linked to fidelity as an implementation outcome) with a view to make any improvements or adaptations in relation to this and other implementation outcomes and to collect early data on intervention outcomes to again use to adapt or revise implementation plans. We focus on this strategy, rather than three other strategies that we saw as overlapping:

- 2: Audit and Provide Feedback;
- 9: Monitor the Progress of the Implementation Effort; and
- 69: Change Record Systems.

Definitions in the literature

The focus on developing a monitoring system indicates that this strategy is not only relevant once an intervention has been introduced in practice and early outcome data needs to be collected. Instead, developing how and what data will be collected is a key part of preparing for the implementation of a new intervention and a marker of readiness (Goldenthal et al., 2021). In our analysis we have subsumed several other data collection and monitoring strategies under this broader strategy, these include 2, Audit and Provide Feedback, and 9, 'Monitor the Progress of the Implementation Effort'.

Careful thought about developing and organising a data monitoring system can also consider how current systems and procedures support implementation and where minor tweaks may be necessary to amplify these supportive elements (Koh and Askell-Williams, 2021). Conversely, these processes can help stakeholders to consider how current systems and procedures may inhibit the goals of implementation, helping to raise awareness of which elements of monitoring systems and procedures may need to be de-implemented to make room for more supportive structures (DeWitt, 2022; Walsh-Bailey et al., 2021).

To what extent does the evidence indicate outcomes?

Evidence indicates that developing and organising quality monitoring systems is a beneficial strategy in isolation and in tandem with other data collection strategies such as:

- 7: develop instruments to monitor and evaluate core components of the innovation/new practice;
- 1: assess for readiness; and
- 8: obtain and use student and family feedback.

Through measuring outcomes like fidelity and pupil outcomes targeted by the intervention, evidence shows that these outcomes can be improved and an intervention is more likely to be sustained.

Gale et al.'s qualitative case study of the implementation of an integrated STEM curriculum in the U.S. school context (2020) found that utilising a range of data sources (including observations and interviews with implementers and pupils) helped those tasked with monitoring to gain a more comprehensive understanding of what elements of practice were working and why. Furthermore, targeted classroom observations where core components were most likely to be evident were found to be particularly valuable in assessing the degree to which fidelity (measured in this way) translated to pupil outcomes. This suggests the potential need for different kinds of data collection and the power of analysing the relationship between different types of data.

Sims and Melcher (2017) in their synthesis of active implementation frameworks notes that that it more than the use of data which shapes the quality of monitoring, it is the intention behind the use of data which can lead to better understanding of implementation outcomes including fidelity and adaptation. Similarly, Ryan Jackson et al's (2018) evidence informed report on the four domains of rapid school improvement describe the importance of intention, clarity, and coherence of monitoring systems. They recommend that a fidelity measure is key and that it should be both practical

(in terms of feasibility to use and providing a reliable measure) and theorised to be highly correlated with intervention outcomes (meaning the presence of core components being measured is predicted to lead to intended outcomes). Action based on this data to support fidelity can help to generate sustainability.

Livet et al. (2018) completed a mixed-methods study with providers in U.S. elementary schools who had implemented one of three mental health interventions. All three interventions were provided on an online platform which gives access to four implementation strategies: intervention resources, online professional development, technical assistance, and, of relevance here, real-time fidelity data and student progress monitoring tools. This shows how dedicated monitoring systems may be part of intervention resources. The use of student progress reports were associated with improved fidelity. Student outcomes were also predicted by fidelity in this study.

Loman et al. (2010) evaluated variables associated with sustainability of First Step to Success, a targeted intervention for young students at risk of behavioural disorders across 29 U.S. elementary schools. Sustainability was measured using an existing measure related to the sustained use of the intervention. Their findings concluded that the use of data for monitoring and feedback intended to inform continuous intervention improvement and implementation outcome monitoring was key to sustaining the intervention, particularly collection and use of fidelity and pupil outcome data over time.

In summary, two reviews, one quantitative study, one mixed-methods study, and one qualitative study demonstrate beneficial impact of developing monitoring systems on outcomes that include adoption, fidelity, sustainability, and pupil outcomes. The evidence reviewed suggests that this strategy can encourage these outcomes and often the measuring of impact on a range of outcomes, although a system alone will not lead to fidelity or improvement in pupil outcomes.

What does the evidence tell us about the situations in which schools might use this strategy?

Developing and organising quality monitoring systems plays a role in understanding and improving implementation processes as well as the efficacy and efficiency of a particular intervention. Early intervention outcome data will vary according to the type of intervention. In the context of a health-related approach, schools may wish to monitor engagement and effects on mental and or physical health because of engagement with a new approach (Gureasko-Moore et al, 2005; Edwards et al, 2014; Pearson et al, 2015; An et al, 2021). In the context of teaching and learning, schools may wish to monitor the impact on learning outcomes (Azukas, 2019; Bishop et al, 2015; McCormick et al, 2020).

As mentioned previously, this strategy focuses on developing and organising collection and monitoring of data in advance, so is not focused only on measuring the early impact of a new intervention in practice. Data collection should be ongoing and consider the short, medium, and long term data needed to show the impact of an intervention and inform decision-making about any changes to plans. Reezigt and Creemers (2005), in their analysis of case studies, propose that evaluation and reflection take place iteratively over time but can be impactful in later phases of implementation when data and reflection will be seen to inform a new cycle of improvement, such as scaling up, adapting, or stopping the intervention. According to Reezigt and Creemers (2005) schools need a monitoring system that allows self-evaluation of whether goals have been achieved. This suggests that the data monitoring system should be responsive and part of the implementation plan.

What does the evidence tell us about how the strategy works well?

Van Geel et al. (2017) evaluated how school characteristics were related to the combined assessment of fidelity, reach, and teaching performance after using a data-based decision-making intervention and sustaining the intervention after two years in the Dutch primary school context. Higher levels of the implementation outcomes were characterised by high levels of motivation amongst staff around using the quality monitoring system to measure and respond to student data. Furthermore, schools with leaders who did not provide teachers with time or resources to use the data had lower implementation scores.

Durlak and Dupre's (2008) ecological framework for understanding effective implementation generated from a review of 81 quantitative studies which described the impact of implementation on programme outcomes, elevates organisational capacity related factors (which influence the development and use of monitoring systems) as particularly influential in implementation. The implication is that input into relevant data collection from those directly involved in implementation as recipients or delivery is important for ownership and use of data and can amplify buy-in and engagement over time. Noting accessibility and the time necessary to collect data is an important consideration here too. Similarly, Ryan Jackson et al. (2018) propose that quality monitoring systems should be both technical and adaptive to context, they should reflect the needs of users and pupils, and should be used with consistency to generate reliable benefits including increased fidelity, penetration of changes, and longer term buy-in.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. As part of the research study fidelity data was collected and this was used to inform supervision and team meetings with group leaders and mentors to address programme implementation challenges. Group leaders also used their own logs to note

points for discussion in these meetings. The study shows the value of reflecting on the data collected, for instance, fidelity data was amended to record the attendance and participation of co-facilitators in sessions.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Here, data establishing barriers and facilitators once the intervention had been introduced were shared with implementation teams. Pupil outcome data was also provided. Data collection through research interviews was used to inform support with implementation strategies in the next school year. Coaches collected fidelity data but as part of the coaching demonstrated how this could be done so that implementation teams would be able to sustain this without support beyond the end of the project.

Goldenthal et al. (2021) report on an evaluation of acceptability, fidelity, and utility of a model to increase the knowledge, skills, and resources that clinicians require to implement an intervention in school settings. A mental health consultation team from a paediatric teaching hospital worked with school district leaders with the goal to increase the implementation, quality, and sustainability of Anger Coping, a targeted intervention aiming to address reactive aggression and disruptive behaviour in schools. Eleven of 91 clinicians delivering the intervention in schools were allocated to receive the implementation support (which included visits, conference calls, and meetings with other clinicians); 'training as usual' clinicians had access to resources but not follow up support. Although collecting pupil outcome data was expected for all clinicians it was completed three times as much by the clinicians receiving the support. It is argued that seeing the impact of their work with students helped buy-in of the clinicians over time.

Schools require organised systems to monitor implementation and pupil outcomes. These systems need to be both effective and efficient to enable the right kinds of data and other forms of relevant information to be gathered, considered and disseminated by the wider implementation team. One example of the type of system that schools can put in place is the 'plan, do, study, act' cycle (PDSA-C) of continual improvement. This procedural system, outlined in the Four Domains of Rapid School Improvement (Ryan Jackson et al., 2018), suggests a format that implementation teams can follow to bring about generative decision-making based on the latest data; the aim of this is to implement small but impactful changes over time.

The elements which schools undertake in the process of PDSA-Cs, particularly around 'study' and 'act', shift the focus towards reflecting on how previous actions have been navigated by those involved so that considered and informed decisions can be made about what actions to maintain, tweak, or de-implement, depending on their effects. These elements resonate with the concept of 'reinvention points' suggested by Evans and colleagues, who define reinvention as the 'refinement or transformation of an intervention through its interaction with individual agents and contextual features' (2015, p. 761). This shifts the emphasis regarding the process of implementation from stakeholders receiving instruction to stakeholders actively negotiating instruction in response to their own interpretations and experiences and the complex systems in which they work.

This empowers stakeholders by encouraging them to share and link their professional expertise with others. This can be further strengthened by asking key questions around how well fidelity has been met, what barriers or facilitators may have influenced impacts and how this has occurred (van Geel et al., 2017), as well as how the next steps can respond effectively. Teams involved in PDSA-Cs may draw on and apply capacity-related and other implementation data to make sense of the degree of fidelity that has been achieved. This multi-step, multi-level process of inquiry is solution focused and aims to adapt and develop implementation plans according to the most relevant data and experiences.

The three-step ASPIRE (Adapting Strategies to Promote Implementation Reach and Equity) Process for adapting equity-explicit implementation strategies (Gaias et al, 2021) suggests that this implementation strategy ought to be considered in relation to equity and school context. While Gaias et al. (2021) note that defining, measuring, and reporting progress is in itself evidenced to improve pupil outcomes, they argue that the monitoring systems schools use need to consider outcomes for different groups rather than pupils as a whole. Analysis of data that might reveal disparities then needs to consider how interventions might be adapted or other strategies used to help respond to the needs of marginalised students. These authors suggest that the focus ought to be on using data to enhance contextual responsiveness and reduce structural barriers to implementation rather than as a measure of fidelity or seeking early beneficial intervention outcomes.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Charlton et al. (2020) suggest that the availability of a monitoring system does not guarantee teams or individual practitioners will necessarily access or use the system to support decision-making. They analysed implementation determinants in relation to critical incidents in the scale up of Multi-Tiered Systems of Support in schools. Evidence suggests that even when a data monitoring system is in place, staff using an intervention may not use the system and it was only through the coaching as part of this intervention that data was utilised. Even then, sustaining data use over time required support from school leaders and implementation teams.

Frigge et al. (2019) report results from a qualitative case study which examined the implementation of a school breakfast programme in U.S. based high schools. They suggest that positioning students as key stakeholders and supporting that with 'process and data to help develop shared meaning' (p.8) may be particularly valuable in scaling up an evidence-

based practice and meeting programme objectives. This echoes the importance of instruments for monitoring having the utility to support sense making and the building of coherence around how a new programme is impacting outcomes.

Chong and Lee (2021) asked school leaders in Singapore schools to complete a SWOT analysis in relation to their use of prevention education programmes (typically social-emotional learning and character education). The analysis showed that monitoring procedures might be in place but they are often not utilised systematically by leaders to inform important decision-making about improving or stopping the use of interventions. Time constraint was identified as a major barrier to school leaders ability to ensure fidelity to implementation processes, and to use the wealth of data to inform ongoing planning.

Brann et al. (2021) used a mixed-methods case study design to identify implementation determinants and strategies related to implementation reach of universal screening for mental health difficulties in two U.S. private schools. On one hand, evidence suggested both schools were using data-informed decision-making to inform interventions that were used. On the other, a barrier was providing teachers access to data rather than summary reports about their students. This suggests the need to work with teachers to consider the kind of data they require access to.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms resonate across evidence around how schools can develop and sustain quality monitoring systems. Fundamentally developing and organising a quality monitoring system is putting in place an *enabling structure* for implementation. However, *agents for change* are instrumental in the process of helping to understand what makes a quality monitoring system work in a particular school context, as it is highly unlikely that a system that works well in one school, will also work equally well in another without context specific knowledge informing adaptations of the system (Hall, 2007 and Van Geel et al., 2017). Quality monitoring systems are also shaped by the nature of the *intervention* characteristics, which may similarly require different adaptations dependent on content and context.

Likewise *reflecting* plays a key role in assessing and monitoring implementation (Hudson et al., 2020; Maxwell et al., 2019; Roach et al, 2009). However, this implementation strategy differs from others that focus on measuring adherence to core components and communicating fidelity data, as it is interested in establishing the system for monitoring. This requires careful *reflection* to establish how well the system is working and where blind spots or challenges may be present (Van Geel et al., 2017; Leeman et al., 2018). Similarly, *engaging* staff and, where appropriate, pupil voices in the processes of *reflecting*, can generate useful insights into what elements of practice are creating impacts—and how (Tunks and Weller., 2009); for example, discourse between staff around how monitoring procedures are working can help to focus on creating a clear picture of how systems are navigated by individuals, thereby empowering those involved in the systems to shape them through expressing their opinions. A solution focused dialogue can also help to overcome challenges productively, limiting losses of engagement with monitoring systems over time (Gale et al., 2020). However, the careful development of a quality monitoring system or consideration of how monitoring can utilise other systems relies on uniting understanding and practice in relation to the importance of using data as a new approach is being implemented.

Our analysis suggests that creating and sustaining *enabling structures* in developing quality monitoring systems and *uniting practice* and values around data-informed decision-making is strongly generative to outcomes. In dynamic monitoring systems there is an active movement away from what Hall suggests is the predisposition to use data to make summative valiative judgements (Hall, 2013). To achieve this, implementation leaders need to engage with the myriad of ways in which stakeholders relate to data (Goldstein and Olszewski, 2015), how they perceive monitoring (Tunks and Weller, 2009), how monitoring has worked previously in implementation (Reezigt and Creemers, 2005), and what repercussions may have shaped subsequent attitudes towards and beliefs about monitoring and its objectives (Gale et al., 2020). This requires senior implementation leaders with decision-making power to facilitate dedicated time and space in which inquiries concerning values and monitoring can take place and where re-invention or evolution in systems can develop in response to how they are being used and how they are serving staff and pupils (Evans, 2015). Where values, perspectives or understanding differ, the role of a facilitator is to mediate and *unite* consensus around feasible and acceptable objectives (Robinson, 2017). This coherent vision for implementation should integrate monitoring positively as a way in which to inform and account for the learning journey (Van Geel et al., 2017). Moreover, it should identify and agree what systems and procedures will represent, how they will function and how they will work to support rather than undermine capacity and momentum (Leeman et al., 2018).

Our realist synthesis indicated the interaction of *enabling structures* and *uniting values and practice* impacting fidelity and sustainability amongst other outcomes as indicated in the ICAMO configuration below. As this strategy is focused on developing and organising a data collection system rather than using data, we found uniting values about the use of data to be more relevant than reflecting on data, which is evidenced in other implementation strategies about the use of data as in the following strategy.

ICAMO configuration for develop and organise quality monitoring systems

When thought is being given to how to develop and organise systems and procedures that monitor implementation, schools may wish to consider enabling structures. Through the lens of enabling structures, stakeholders can assess

and identify what types of systems and procedures may help staff to evaluate practice over time, including engaging pupils actively in guided reflections on the progress of their own learning. These systems and procedures need high levels of accessibility and simplicity to be acceptable and usable for staff who are balancing a myriad of other responsibilities and tasks and must reflect the needs of pupils and staff to increase the likelihood of sustainability and longer-term engagement. Senior leaders or those with decision-making authority over systems and procedures need to take a lead on discussions which aim to develop critical engagement with their use, accessibility, and value. All members of the school community who will be expected to use systems and procedures should have a meaningful role in their development, however, including in piloting and evaluating the data collection system. In the early stages of implementation, it can be helpful for implementation leaders to scaffold and support conversations around the role of data practice in relation to improvement. This can help to explore values and understanding in relation to data, which can generate powerful insights into apprehensions or preferences. If mediated effectively, differences can be identified as well as how these can be addressed, which can lead towards the development of shared principles and practices around the types of systems and procedures that are understandable and meaningful to school stakeholders. This unites values and practices about the importance of collecting data to inform decision-making. This can ensure that systems and procedures are useful, relevant, united, and functional in relation to the professional values that shape the school community. Processes which seek to unite values can help to foster cohesion, can address staff and pupil needs, and may increase the likelihood of greater engagement over time with systems and procedures. A quality monitoring system can help to review and improve outcomes collected including fidelity and pupil outcomes, as well as helping to sustain the intervention when outcomes are positive.

Implementation strategy 6: Develop and Organise Quality Monitoring Systems.

Develop and organise systems and procedures that monitor implementation and/or student outcomes for the purpose of quality assurance and improvement.

Context	Actor	Mechanism	Outcome	Evidence
Enabling structures: establishing new data practices around a particular intervention or adapting existing systems.	School leaders/implementation leaders.	Uniting: values and understanding around data and its uses helps to establish where frictions or concerns occur in relation to data usage to ensure that needs, priorities and capacities are addressed.	System that collects the right data is in place. Fidelity Pupil outcomes Sustainability	Hall., 1997; Reezigt and Creemers, 2005; Tunks and Weller, 2009; Goldstein and Olszewski, 2015; Robinson, 2017; Van Geel et al., 2017; Leeman et al., 2018; Metz et al., 2020; Gale et al., 2020.

CERQual confidence rating: Low

Summary

Evidence suggests that developing and organising a quality monitoring system can have an impact on the outcomes that it collects, including fidelity and pupil outcomes. This can also help sustain the intervention as it provides a system that focuses on targeted outcomes and can demonstrate this over time. The focus in this strategy is on developing the right system to monitor outcomes relevant to an intervention over time and to share this with staff and other stakeholders. In doing so, the importance of data to inform decision-making about an intervention can be relayed and encouraged. While there is evidence confirming the importance of this strategy and how it may be considered, there are some concerns about the coherence of the finding because developing the monitoring system alone is not going to impact outcomes in the same way that reviewing the data as part of other strategies can. As such, the ICAMO is rated at a low level of confidence.

7. Develop instruments to monitor and evaluate core components of the innovation/new practice

SISTER Strategy 7, 'develop instruments to monitor and evaluate core components of the innovation/new practice' (Cook et al., 2019) involves developing, validating, and bringing together (where necessary) tools to measure the fidelity with which staff are implementing the core components of an intervention. This implies the importance of identifying core components and understanding of fidelity as an implementation outcome.

Definitions in the literature

Van Geel et al (2017) proposes a loose definition of data in education as the various forms of information which a teacher or other professional gathers to elicit a clearer picture of pupil needs and outcomes. They also note a growing recognition that data 'should not only be used for compliance and accountability but also for continuous improvement' (2017, p. 361). This view suggests that data use is iterative rather than occurring at pre-determined times and when used alongside tools or instruments can help implementers to gauge changes over time and inform decision-making. The implication is that fidelity data might be used to assess whether an intervention is being delivered as it should but could also be used to identify changes in data over time and identify support needs for individuals.

Considering the above, when developing instruments to monitor and evaluate core components of an innovation/new practice, school implementers are aiming to look beyond simply monitoring the degrees of fidelity that an approach is being delivered with: they are also monitoring and evaluating how broader influences are impacting on fidelity to establish what elements of practice are working, and how (van Geel et al, 2017). There is also a relationship with SISTER Strategy 50, 'facilitate a relay of intervention fidelity and pupil data', which describes the ways in which the data collected using monitoring instruments is shared with staff which we analyse later. Here we focus on developing the instruments to collect this data.

To what extent does the evidence indicate outcomes?

A range of empirical studies that were often small scale demonstrate that school staff can use instruments to measure fidelity of intervention delivery. This can in turn improve fidelity or maintain it over time. However, support is often needed to use this data and monitoring this data can also improve buy-in. Livet et al. (2018) completed a mixed-methods study with providers in U.S. elementary schools who had implemented one of three mental health interventions. All three interventions were provided on an online platform which gives access to four implementation strategies: intervention resources, online professional development, technical assistance, and, of relevance here, performance feedback loops, which included real-time fidelity tracking alongside student progress monitoring tools. Interview participants reported that proactively monitoring their fidelity-use enhanced their accountability and explained how seeing activities that had been missed then improved fidelity. However, the majority of interviewees reported not acting on the fidelity reports because of lack of time and uncertainty about what to change on account of the data.

Scaletta and Tejero Hughes (2021) conducted a small-scale evaluation of five elementary schools in the U.S. context that implemented sustained schoolwide positive behavioural interventions and supports (SWPBIS). Part of the intervention involves collecting annual fidelity data. Although this was not fitting with ideas to respond to ongoing changes in fidelity, it was used to consider level of buy-in and to inform action planning for the following school year. School leaders reported that conversations about the fidelity data, and decision-making related to this, and other data helped to maintain continued buy-in.

Goldenthal et al. (2021) report on an evaluation of acceptability, fidelity, and utility of a model to increase the knowledge, skills, and resources that clinicians require to implement an intervention in school settings. A mental health consultation team from a paediatric teaching hospital worked with school district leaders with the goal to increase the implementation, quality, and sustainability of Anger Coping, a targeted intervention aiming to address reactive aggression and disruptive behaviour in schools. Eleven of 91 clinicians delivering the intervention in schools were allocated to receive the implementation support (which included visits, conference calls, and meetings with other clinicians); 'training as usual' clinicians had access to resources but not follow up support. All clinicians had access to fidelity forms to self-rate their adherence, including against essential components of sessions. Monthly site visits supported this fidelity monitoring for the intervention group clinicians. Ten of the 11 clinicians completed fidelity data; none of the training-as-usual group did. This shows that providing tools to monitor fidelity is not sufficient for practitioners: there also needs to be support and encouragement to use this.

Oliver et al. (2015) examined whether teachers use of a self-monitoring checklist helped to maintain their fidelity in using the Good Behaviour Game intervention. Teachers completed initial training and received performance feedback from an observing researcher until teachers received 100% fidelity scores for a minimum of five days. Then teachers used the intervention with a self-monitoring checklist without this performance feedback. The researcher randomly observed or checked the completed checklists on some days but not all. All teachers were delivering the intervention with 100% fidelity in this self-monitoring phase suggesting that after initial training teachers could accurately rate their level of fidelity and suggesting that the checklist may have been a useful tool to both measure and prompt this fidelity and clearly maintained fidelity compared to when performance feedback was received. This study suggests that once teachers are

practiced in what using an intervention with fidelity looks like a less intensive tool like self-monitoring may be sufficient to maintain this.

Fallon et al. (2018) aimed to assess the impact on fidelity from emailed prompts and later performance feedback in a study with three elementary school teachers delivering a class-wide behaviour management intervention received initial training and then—when fidelity was lower than 80% on two occasions in a week—received a week of email prompts from consultants and then up to two weeks of performance feedback. Performance feedback led to greater mean gains in fidelity compared to the prompts, although the latter were rated as more acceptable than feedback by teachers and were quick to provide.

Von der Embse et al. (2019) report on data from the first two years of a project integrating mental health services and trauma-informed practices in a U.S. middle school. As part of the support provided to teachers, coaches worked with teachers after they completed the Devereux Classroom Observation Tool (DCOT)—an observation tool designed to measure fidelity of behaviour related classroom practices by an independent observer. Coaches then used this fidelity data to work with teachers to select an area for improvement and provided weekly performance feedback. Overall, every teacher reached mastery on at least one targeted skill area and made significant improvement in three areas. Clearly a coach was supporting the use of fidelity data to target teacher action but in year two of the project several school staff were trained to use the DCOT and coach other teachers.

In summary, four quantitative studies and two mixed-methods studies demonstrate beneficial impact of developing instruments to monitor core components on outcomes that include fidelity and buy-in. The evidence reviewed suggests that providing the means to measure fidelity can often encourage implementers to collect and use this data to improve their fidelity to an intervention.

What does the evidence tell us about the situations in which schools might use this strategy?

Messages about the kinds of situations and how schools put in place data collection related to core components overlaps with the broader monitoring system strategy. It is valuable for implementation leaders to generate a clear and coherent view of what types of data will be most helpful and why and how it can be gathered in ways that do not overburden staff with unnecessary tasks or paperwork (Goldenthal et al., 2021). The meaningful integration of data-use into implementation processes can be most impactful when approached hand in hand with processes of reflecting, especially around (1) cultivating a vision, (2) cultivating relational support, (3) cultivating competencies such as critical thinking, (4) cultivating a highly contextual and accessible data climate, and (5) cultivating connection and curiosity between inner school stakeholders around data uses and practices (Schildkamp, 2019; Metz et al., 2021). These elements are valuable during the initial stages of development of instruments to measure and evaluate implementation where it be helpful to generate a clear and coherent view of what types of data will be most helpful and why and, moreover, how it can be gathered in ways that do not overburden staff with unnecessary tasks or paperwork and how it will be used to better understand practice (Goldenthal et al., 2021).

What does the evidence tell us about how the strategy works well?

Bishop et al. (2015) conducted a small, single-subject experimental design with three early years teachers to consider the impact of video self-monitoring where teachers viewed video of themselves implementing embedded instructional learning in their classrooms and completed a self-evaluation. When this was coupled with training in response to needs demonstrated by the data and feedback on the accuracy of self-monitoring there were increases in fidelity. Sustaining use of the intervention was, however, an issue across teachers and as such self-monitoring alone may not be sufficient as an instrument to measure fidelity.

Schildkamp's work on data-based decision-making for school improvement, which outlines how leaders and teachers can use data effectively to implement school improvement (2019), proposes that 'sense-making' is a pivotal mechanism for change. Moreover, this is necessary since data use does not 'happen in isolation: data use is influenced by system, organisation, and team/individual factors' (2019, p. 257). While helpful, Schildkamp acknowledges that current theoretical models of data use lack suggestion of how we can promote the 'enablers of effective data use' (2019, p. 257). Our analysis addresses this limitation through indicating the potential role of context and actors involved in processes of data use in school implementation.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. As part of the research study fidelity data was collected, group leaders in the school were provided with these measures to monitor implementation adherence and quality. Sessions were also videotaped for observational coding of fidelity as part of the research study and therefore group leaders had feedback on their data collection. Although this strategy targeted fidelity, the wide range of strategies used in the study means it is challenging to isolate the impact of this on implementation outcomes. However, the study reported how data was used to address dips in fidelity, such as beginning to monitor attendance from staff in intervention sessions and asking school staff to sign a contract committing to use of the intervention in year four of the project.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Goldenthal et al.'s (2021) small scale exploratory study of the development of a training and implementation model for school-based behavioural health interventions found that the most frequently mentioned barriers to data collection included teachers not returning data as well as group leaders feeling they did not have time available to collect data. Therefore, time is a key facilitator or barrier to data collection and influences the development of monitoring and evaluation instruments that are likely to be acceptable and feasible to implementers. Instruments which help to streamline the data collection process may help to engage staff more readily than instruments which add unnecessary complexity.

Fixsen et al.'s (2005) synthesis of implementation literature across domains including education suggests that the ways in which staff approach evaluation and fidelity are influenced by context (the essentials that must be in place for a programme or practice to operate successfully), compliance (the extent to which the implementer uses the core intervention components outlined by the evidence-based practice and avoids adding in or exchanging for non-evidence-based practice), and competence (implementer level of skill). Therefore, fidelity measures which aim to capture contextual, compliance and competence factors are well placed to inform the development of effective instruments to monitor the delivery of the core components of an innovation.

Waltz et al. (2019) asked implementation experts to match contextual barriers to the Expert Recommendations for Implementing Change (ERIC) taxonomy (Powell et al., 2015), which preceded the SISTER list of education-specific strategies; participants rated two contextual barriers as most relevant to the strategy of developing instruments to monitor and evaluate core components of an innovation. These barriers were organisational incentives and rewards and planning. This resonates with Schildkamp's (2019) concept of establishing the building blocks for an effective data climate where the support structures enable enough time and guidance for implementers to develop data literacy, confidence, and motivation to utilise new instruments for monitoring. Instruments must therefore not be developed in isolation but within wider support structures which can help implementers to understand their uses effectively.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold relevance to developing instruments to monitor and evaluate core components of an innovation. Developing instruments to monitor and evaluate implies putting in place an *enabling structure* for implementation. However, *intervention features* act as a framework in which to think about what will require examination through the development of tools or instruments, in particular the identification of core components and how observable outcomes can be measured (Gagnier and Fisher, 2020). Once instruments are developed further *enabling structures* are required to implement them, structures which help streamline data collection and minimise burden on staff for example enable more effective use of instruments, whilst structures which are over complicated or require extensive time act as barriers (Albers et al., 2021; Pearson et al., 2015).

Our realist synthesis suggests that data instruments in school implementation can be generative, having the potential to yield greater coherence, understanding and *united practice*. Although who has a say in how data instruments are developed and implemented varies across schools; evidence suggests that they can help senior leaders as well as wider stakeholders to generate a comprehensive picture of pupil needs and the impact of implementation strategies (van Geel et al., 2017). Collaborating with staff in *reflective* processes of sense-making where data is contextualised and considered in terms of why and how fidelity outcomes have occurred, helps to both develop and fine tune instruments which can foster greater degrees of consistency in use (Goldenthal et al., 2021; Schildkamp et al., 2019). On the other hand, the development of instruments in isolation with an absence of collective sense making, risks developing unsustainable instruments with unexplored potential (Scaletta and Tejero Hughes, 2021). A difference noted in the evidence in relation to this strategy was the consideration and *reflection* on which tools will be used and how implementation leads will work with the data. While, time spent developing helps unite understanding about data-based decision-making, for this strategy evidence suggests that *reflection* about how data is collected and then used is key.

Our realist synthesis indicated the interaction of *intervention features* and *reflecting on fidelity data* impacting fidelity amongst other outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for develop instruments to monitor and evaluate core components

Intervention features will indicate the extent to which core components of an intervention are identifiable and observable and therefore be an important condition to consider when developing instruments to measure this. Some interventions may be more difficult to measure fidelity data or it may be less meaningful where interventions are more flexible in their use. School staff implementing an intervention are key actors as it is their fidelity data that is being measured and it is important to consider how this is used as it can impact buy-in and whether the use of data will be meaningful and supportive. Implementation leaders facilitate conversations around what types of data instruments may be most helpful in collecting data. It is important that both implementation leaders and school staff delivering an intervention have instruments that allow for reflection on fidelity data. Rather than punitive measures used to identify shortcomings, the instruments can be more holistic and help to understand why there may be differences in fidelity between staff and over time and indicate needs to address this. Effective and efficient data instruments that measure fidelity to core components

can help implementers to understand practice and make changes in ways that can improve fidelity, adaptation, and sustainability.

Implementation Strategy 7: Develop instruments to monitor and evaluate core components of the innovation				
Develop, validate, and integrate measurement instruments or tools to monitor and evaluate the extent to which school personnel are implementing the core components of the intervention (i.e., with fidelity).				
Context	Actor	Mechanism	Outcome	Evidence
Intervention features (whether core components are clearly identifiable and measurable).	Implementation leaders who can source measures and school staff delivering interventions.	Reflecting (instruments to monitor fidelity allow for evaluation of why any dips in fidelity may occur).	Fosters meaningful and accessible data practices around fidelity to core components. Fidelity Sustainability	Schildkamp et al., 2019; Goldenthal et al., 2021; Scaletta and Tejero Hughes, 2021; Livet et al., 2018; Oliver et al., 2015; van Geel et al., 2017; Pearson et al., 2015; Gagnier and Fisher, 2020; Albers et al., 2021.
CERQual confidence rating: Moderate				

Summary

There is a range of evidence that developing instruments to monitor and evaluate core components of an innovation is a beneficial strategy in isolation or alongside other related actions. Data instruments can be most insightful for practice when they reflect the needs and perspectives of those involved in implementation. Specific information (such as how a specific resource facilitated or inhibited attainment of pupils) and general information, such as how unexpected outcomes might occur between various areas of implementation is helpful in generating understanding. Our realist synthesis shows how intervention features set the conditions for which core components need to be measured and how accessible measures of fidelity for these may be. Once the measure is developed or selected, it is important that its use is clearly articulated so that it is a tool for evaluation and needs assessment, rather than a summative assessment of who is delivering well. This can impact buy-in as well as the fidelity being monitored. There is a slight concern that the coherence of this finding is limited in relation to the intervention features context. There is data that shows fidelity measures exist for core components of well-specified interventions but little evidence of how and whether fidelity is measured when core components are less clear or the intervention is flexible in its delivery. The ICAMO configuration is therefore rated with a moderate level of confidence.

39 and 44. Provide ongoing training and consultation/coaching

SISTER Strategies 39, 'conduct ongoing training', and 44, 'provide ongoing consultation/coaching', are categorised by Cook et al. (2019) as strategies to train and educate stakeholders. They are described as 'plan for and conduct training in new practices in an ongoing way and provide ongoing consultation/coaching with one or more experts in the strategies used to support implementing new practices'. Given the shared focus on this professional development being ongoing, distinguishing these two strategies from the other PD strategies, we consider them together, notwithstanding that some evidence will be particular to one to one coaching or consultation.

Definitions in the literature

The key distinguishing marker of these strategies is that professional development is ongoing. This ranges from more ad hoc training and consultation that responds to needs to predetermined session numbers but that still allow for responsivity to school staff needs (Goldstein and Olszewski, 2015). Two main types of coaching are described in the literature (Lyon et al., 2011). Expert coaching involves coaching provided by an expert in the intervention or implementation of similar approaches. Peer coaching involves peer to peer feedback, although this may be with colleagues who have more expertise themselves in relation to the intervention.

To what extent does the evidence indicate outcomes?

A wide range of evidence, including from several reviews, shows the benefit of ongoing training, consultation, and coaching on a range of outcomes including fidelity, adoption, pupil outcomes, and sustainability. There is evidence of

the benefit of ongoing training over one-time training, and consultation and coaching that involves performance feedback.

Lyon et al. (2011) review training and support approaches that may be applied to training in mental health. The review draws on an interdisciplinary literature including teacher training, as well as more clinical training. The most robust finding presented in the review is that single-exposure professional development is ineffective in producing behaviour change, therefore supporting this strategy. Ongoing training is necessary given the time that is often needed to develop proficiency in a new intervention and the opportunity for active learning. Coaching tends to report strong effects for fidelity and sustaining intervention in practice (Lyon et al., 2011).

Baffsky et al. (2023) have systematically reviewed effective strategies for enhancing the implementation of mental health prevention programmes in schools. The authors used the SISTER strategies to categorise implementation strategies in the literature. The most commonly assessed strategies were both the ongoing PD strategies, appearing in two thirds of studies. Six quantitative studies found ongoing training had a positive effect on fidelity, while five other quantitative or mixed-methods studies reported equivocal effects on fidelity. Three qualitative studies evidence that ongoing training is associated with adoption. Six quantitative studies found a positive effect of ongoing consultation on fidelity, while another six studies found equivocal effects. Two qualitative studies reported positive findings for adoption. Impact on fidelity is not always evidenced, although the review found no studies suggesting a negative impact on fidelity.

Ongoing consultation is often associated with performance feedback. Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional, and behavioural needs. They found a large beneficial effect on fidelity from 22 of the 28 reviewed studies that reported performance feedback as a strategy used. Performance feedback was the most frequently coded behaviour change technique.

Stormont et al. (2015) more directly evaluated coaching as an implementation strategy with teachers using social behavioural interventions in their literature review; 29 studies were included. Most studies reported beneficial effects of coaching, however, only nine articles measured fidelity: eight of these showed positive effects, the remaining study showing neutral results. Coaches tended to be experts on the intervention and coaching often included performance feedback.

Reinke et al. (2008) investigated the impact of whole class consultation as opposed to consultant advice to teachers on behavioural support for targeted pupils. Four teachers participated in a multiple baselines design. Consultation, which included intervention advice, identifying strengths, and encouraging decision-making plus visual performance feedback, increased the self-reported fidelity with which the teachers used behaviour management strategies and decreased disruptive classroom behaviour.

Noell et al. (2013) completed a meta-analysis of single subject design studies evaluating the use of treatment plans by teachers or other staff in schools. The type of professional development used to train teachers was coded. Fidelity was extracted as an implementation outcome measure. The review reported that consultation that did not include review of data was ineffective in supporting fidelity. However, performance feedback, including when it was combined with practice and time allocated for the consultation increased fidelity. Finally self-monitoring when encouraged as part of other support increased fidelity too.

Goldenthal et al. (2021) report on an evaluation of acceptability, fidelity, and utility of a model to increase the knowledge, skills, and resources that clinicians require to implement an intervention in school settings. A mental health consultation team from a paediatric teaching hospital worked with school district leaders with the goal to increase the implementation, quality, and sustainability of Anger Coping, a targeted intervention aiming to address reactive aggression and disruptive behaviour in schools. Eleven of 91 clinicians delivering the intervention in schools were allocated to receive the implementation support (which included visits, conference calls and meetings with other clinicians), 'training as usual' clinicians had access to resources but not follow up support. There were monthly site visits and conference calls offered by district employed coaches. Clinicians made more use of the site visits and reported high levels of fidelity and improved pupil outcomes compared to control group clinicians.

Gregory et al. (2021) conducted qualitative interviews with practitioners using restorative practices as a behavioural approach in U.S. schools. The study aimed to identify components of implementation that supported building infrastructure, increasing staff and student capacity and putting in place different levels of support. Participants framed the professional development they received as continuous and experiential. This appears to be linked to sustainability as an outcome rather than fidelity, perhaps this is linked to the type of intervention or because schools were engaged in long-term funding or research projects.

Loman et al. (2010) evaluated variables associated with sustainability of First Step to Success, a targeted intervention for young students at risk of behavioural disorders across 29 U.S. elementary schools. Sustainability was measured using an existing measure related to the sustained use of the intervention: 28% of all respondents considered high-quality FSS coaches as critical to sustaining FSS at their school. Their findings showed that schools sustaining the implementation were far more likely to have a full-time equivalent coach working on supporting teachers with the programme.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services, participants considered both ongoing training and consultation as particularly important and also feasible.

Tunks and Weller (2009) evaluated a programme designed to support Grade 4 teachers use of algebraic thinking in their maths teaching. The study examined changes in teachers' behaviour and changes in their concerns over time. The programme was designed around both the importance of continuous support and identifying concerns to guide delivery of support. One of three key variables that findings showed helped teachers adopt the teaching in their classroom included personal contact with supportive staff members, in the monthly meetings, but particularly in the monthly observation and conference visits. Sharing resources with other teachers and seeing students' success also impacted this. The study suggests that ongoing support may not only be about performance feedback but about trust building, observation and discussion.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. Providing ongoing consultation and coaching was one of 37 implementation strategies used. This was related to fidelity as an implementation outcome. For three years of the project, group supervision was weekly for one hour before, in year four, there were individual check ins. This suggests that consultation may not only be required soon after an intervention is introduced (cf. Phillips et al., 2020).

Sims et al.'s (2021) evidence review suggests that PD will be more effective where participants are required to revisit prior learning (mechanism 2). This is a mechanism that contributes to building knowledge. It includes revisiting earlier topics and techniques in later PD sessions, quizzing participants on prior learning and revisiting material through discussion, quizzes or use of tasks that draw upon skills learnt earlier in the PD programme. This is thought to consolidate learning and improve the likelihood of knowledge being retained.

In summary, a wide range of studies including six reviews, four quantitative studies, one mixed-methods study, and two qualitative studies demonstrate beneficial impact of training and coaching that is ongoing on outcomes that include fidelity, adoption, pupil outcomes, and sustainability. The evidence reviewed suggests beneficial outcomes when this ongoing support is used flexibly in response to needs rather than at a set interval.

What does the evidence tell us about the situations in which schools might use this strategy?

Ongoing training and coaching may be of particular relevance where an intervention represents a particularly new practice for school staff. Chambers et al. (2020) used qualitative case study methods to evaluate the introduction of the universal free school meal programme for children in their first three years of primary school in Scotland. This provides an example where ongoing training is needed as it was reported to occur in response to new practices and equipment.

Phillips et al. (2020) in their evaluation of fidelity to a software based tutoring system note that coaching may be of particular importance when staff have just been introduced a new intervention. Other research suggests that training and coaching may be of use over the longer-term, particularly to respond to dips in fidelity over time (e.g. Aragon et al., 2021; Moore et al., 2021).

Evans et al. (2015) interviewed programme stakeholders in secondary schools in Wales where a social and emotional learning (SEL) intervention was implemented focused on how the intervention diffused across schools. They noted professional development as a potential reinvention point but describe how only including one three-day training programme that did not give teachers confidence to deliver all the programme led to adaptations. The authors conclude that the intervention may not have been discontinued had substantial and ongoing training been provided.

What does the evidence tell us about how the strategy works well?

Some evidence suggests that the ongoing nature of training and coaching means it can adapt to recipients' needs. Aragon et al. (2021) describe the training that was delivered as part of a food and nutrition intervention where implementation was evaluated in a mixed-methods study. Their training included booster training as an implementation strategy that sought to reinforce initial training and prevent drift in intervention fidelity, which findings show was achieved.

Beidas and Kendall (2010) reviewed school-based, as well as clinic and community studies training therapists in evidence-based interventions and found that only professional development that includes active learning along with ongoing coaching and feedback was effective in promoting clinician change. This suggests the importance of both this strategy and Strategy 3, 'make training dynamic'.

Goldstein and Olszewski (2015) describe the process of developing and implementing a phonological awareness curriculum designed for preschoolers demonstrating delays in literacy development. A post-hoc analysis mapped the stages of intervention development to the EPIS implementation model. Researchers sought feedback from teachers and observed implementation of the intervention after their professional development. Further training and support needs could be identified. The study suggests ongoing coaching or other support is needed. However, the authors suggest that this may not need to be face-to-face consultation and ongoing support could be via frequently asked questions, message boards, videos, and supplemental documents. This would allow teachers to access information more easily and as needed.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Coaching was a key part of the implementation support although it is not clear how that supported implementation in isolation from other implementation strategies. However, the study does show the variable format of coaching, including through email and phone, as well as in-person meetings.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Owens et al. (2019), in a pilot study considering the feasibility and effectiveness of an online daily report card by elementary school teachers, showed that even when the intervention was targeted towards teachers who had not previously received professional development on the intervention, teachers had a range of professional development needs which could not easily be addressed through online professional development built into the intervention resources. They argue that there will be individual differences in which teachers need face-to-face consultation. Consultation then might be targeted to the teachers who will benefit from this or where fidelity has become an issue. Less intensive PD availability may support the majority of teachers.

Ryan Jackson et al. (2018) present a framework for leading schools through rapid improvement. Some of the implications raised around professional development are unique. The authors propose that a facilitator of ongoing training or coaching is that the coach will learn areas of strength and development based on data and as part of the coaching relationship.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to ongoing training and coaching because this professional development over time needs to be accommodated and evidence suggests made a priority so it does take place. Coaches are *agents for change* as they can respond to teachers needs and address these. Like other professional development strategies, ongoing training and coaching *unites* understanding about the intervention. However, the focus on professional development over time allows for *reflection* both on the part of school staff receiving the training or coaching, or by trainers/coaches, so that their professional development can be tailored to needs.

Our realist synthesis indicated the interaction of enabling structures and reflection on fidelity and sustainability as indicated in the ICAMO configuration below. Although coaching is likely to *unite* understanding of an intervention in line with other professional development strategies, we prioritised evidence for the mechanism that helped explain how the *ongoing* nature of these strategies can drive outcomes, therefore evidencing the *reflection* enabled by ongoing professional development.

ICAMO configuration for Provide ongoing training and coaching

The enabling structures context is important for the strategies 'conduct ongoing training' and 'provide ongoing consultation/coaching'. Using the strategy requires that school leaders build time for ongoing training and ongoing coaching into their termly/annual plans, consider ways to fund this and where they will source training and coaching/consultation from. Because the strategies require planning and funding at the school level, school leaders are important actors for this strategy. In addition, programme developers are important actors because evidence suggests that ongoing support in the form of training and consultation is a responsibility for intervention developers to provide. Reflecting as a mechanism is triggered by an enabling structure for this strategy as it indicates that staff will be facilitated to reflect on their knowledge periodically. This may include individual and collective reflection around areas for growth, fidelity to core components, views about the intervention, challenges to successful implementation and ways in which these have been overcome. Ongoing training also allows new staff to develop their knowledge when joining a school. They can provide new perspectives and learn from the reflections of existing staff. Ongoing training, consultation and coaching supports the whole school to sustain implementation and maintain fidelity. It facilitates reflection amongst existing staff and helps new staff to feel adequately equipped to implement practices.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

<p>Implementation Strategy 39: Conduct ongoing training; Strategy 44: Provide ongoing consultation/coaching</p>
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<p>Plan for and conduct training in new practices in an ongoing way.</p>
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<p>Provide ongoing consultation/coaching with one or more experts in the strategies used to support implementing new practices.</p>

Context	Actor	Mechanism	Outcome	Evidence
Enabling structures (allocating necessary funds and time for professional development to occur over time, building into plans).	School leaders and training providers, e.g. programme developers.	Reflection (on areas for growth, successes, challenges).	Fidelity Sustainability Pupil outcomes	Lyon et al., 2011; Merle et al., 2022; Stormont et al., 2015; Reinke et al., 2008; Noell et al., 2013; Aragon et al., 2021; Owens et al., 2019; Evans et al., 2015; Samdal, 2010; Desomine, 2002; Ryan Jackson et al., 2018; Goldenthal et al., 2021; Chambers et al., 2020; Tunks and Weller, 2009.
CERQual confidence rating: Moderate				

Summary

A wide range of evidence, including reviews, supports the beneficial impact of training and coaching or consultation that is ongoing. The enabling structure for such ongoing training is a key context to put in place so that the benefits of tailored professional development that allows for reflection can be realised. A range of evidence suggests the benefit of the strategy and the key context of accommodating and prioritising this ongoing professional development. There is a concern about adequacy of data as less evidence speaks to reflection as the key mechanism, although it is clearly triggered by the nature of the strategy being accommodated over time. The ICAMO is therefore rated as a moderate level of confidence.

14. Provide practice-specific supervision; 30. Model and simulate change

Two related SISTER taxonomy implementation strategies that schools may use are to model and simulate the change that will be implemented prior to intervention and then later provide intervention-specific supervision to those who are delivering new practices with evaluative feedback.

Implementation behaviours can be modelled and simulated (Cook et al., 2019, strategy 30) and supported by supervision (Cook et al., 2019, strategy 14) so those involved in implementation will learn and mirror those behaviours. Although the strategies seem to indicate that modelling happens in advance of delivery and supervision once an intervention is being used, modelling and supervision can take place across phases of implementation. Their impact is likely to be greater when preparing to implement and early in the delivery stage. Modelling of implementation behaviour, rather than how to deliver a specific intervention procedurally, is likely to be conducted by implementation leaders. Supervisors are also typically school staff in a position of authority and are assessing the performance of school staff implementing new practices. This distinguishes supervisors from coaches and consultants detailed above.

Definitions in the literature

Supervisors are in a position of authority and support school personnel who deliver new practices with evaluative feedback via performance assessment. Supervision is typically differentiated from consultation/coaching, which may be provided by an internal or external individual who may or may not have authority over the implementer (Cook et al., 2019).

School leaders, whether principals, department heads, or implementation team members, can model implementation behaviours so school staff involved in implementing the intervention can understand, learn and enact those behaviours (Aarons et al., 2016; Ryan Jackson et al., 2018). Implementation leadership can therefore involve role modelling of behaviours to support the uptake of a new intervention (Albers and Pattuwege, 2017).

There were sufficient commonalities in the messages within the studies to warrant considering the evidence together and suggest supervision might continue or occur in conjunction with the work of modelling.

To what extent does the evidence indicate outcomes?

A small range of evidence that ranges from reviews to case studies indicates that modelling implementation behaviour can impact on fidelity and buy-in as implementation outcomes. Evidence shows that both supervision and modelling can increase adoption of an intervention. At times it is hard to discern in the evidence between modelling of implementation behaviour versus intervention delivery and supervision that is specific to implementation of an intervention.

Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional,

and behavioural needs. They found a large beneficial effect on fidelity from seven of the 28 reviewed studies that reported modelling as a strategy used.

McLoughlin et al. (2022) evaluated a school wellness programme to assess implementation outcomes of adoption, fidelity, penetration and sustainment. Mixed-methods data collection from 52 U.S. schools took place. A wide range of implementation determinants were reported in the study. The highest ranked determinant in terms of impacting the implementation outcomes from interview data was leadership engagement, so having schools leaders involved and supportive. This was positively correlated with penetration, fidelity and adoption at a statistically significant level.

Simmons and Martin (2016) interviewed leaders at the school district level about barriers to implementing a computing device for each student across a U.S. school district. The study evidences the importance of school leaders having access to professional development and resources so that they can model effective technology use in this example. Seeing a leader, whether in school or at district level, modelling the change they are encouraging is reported to be important for encouraging buy-in. While the findings suggest school leaders modelling effective use of the intervention is important, there is also evidence that school leaders can model their own skill development and therefore reduce fear of failure in others.

Leis et al. (2017) conducted a mixed-methods study investigating the relationship between successful implementation of a professional development and coaching model designed to build trust and enhance communication among colleagues in schools and changes in teacher-leadership trust in eight U.S. schools. Level of implementation was measured using the Implementation Process for Teams measure of competence and commitment to the 'Leading Together' intervention. This allowed comparison between schools scoring higher versus lower on implementation outcomes. Of relevance to this implementation strategy, in schools with lower implementation outcomes, school leaders did not share decision-making in relation to the intervention and did not model making time for the intervention activities themselves. In these schools, the intervention was not introduced in a way that showed staff it was a good fit for the school. These findings imply the importance of school leaders' role modelling their engagement and belief in an intervention, particularly when the intervention involves them.

Schildkamp et al. (2019) report, in their case study research from four Dutch schools on building effective data teams, how staff benefitted from individual support from school leaders who answered questions and overcame concerns or negativity, thereby improving adoption. The Bill and Melinda Gates Foundation (2013) in its study on high quality instructional and formative assessment tools that support teachers' incorporation of the U.S. Common Core State Standards (CCSS) makes the case for school leaders working directly with teachers to achieve the alignment that enables the successful use of the tools. It evidences that leaders taking an active role, either working directly with teachers or selecting and empowering talented staff, who are given roles and responsibilities to work with teachers on tool implementation, will lead to broader and deeper adoption of the tools in teachers' practice. This increased adoption is tied to the increased alignment between the intervention, improvement area, current practice, and outcomes that the leaders' active role facilitates. This is supported by Hollingshead (2009) who also show the overlap between modelling and supervision in relation to adoption as an outcome. They evidence that adoption of an innovation is influenced by the facilitation provided. If staff implementing an intervention receive no supervision or other support then they may never fully adopt the intervention—i.e. achieve only partial participation in and implementation of the intervention—reducing a range of other implementation outcomes including fidelity.

In summary, one review, four mixed-methods studies, and one qualitative study demonstrate beneficial impact of supervision and modelling on outcomes that include fidelity and buy-in. The evidence reviewed suggests beneficial outcomes when the supervision and modelling (in particular) are delivered by school leaders.

What does the evidence tell us about the situations in which schools might use this strategy?

Von der Embse et al. (2019) report on data from the first two years of a project integrating mental health services and trauma-informed practices in a U.S. middle school. As part of the support provided to teachers, the study built capacity by creating a district-wide set of supervisors able to guide the intervention decision-making using screening and progress monitoring data.

Williams et al. (2021) conducted a qualitative study with teachers interested in how school leaders help them implement evidence-based practices for students with autism. Teachers who perceived their school climates as functional often reported that their principals provided direct assistance or coaching to support the implementation of evidence-based practice; or, if the principal lacked this expertise, they facilitated this support from others. School leaders reviewed lesson plans, came into the classroom regularly, and helped problem-solve challenges. This appeared to be a mix of assistance and role-modelling.

The three-step ASPIRE (Adapting Strategies to Promote Implementation Reach and Equity) process for adapting equity-explicit implementation strategies (Gaias et al, 2021) suggests that practice-specific supervision ought to be considered in relation to equity and school context. Because supervision supports new practice and supervisors are in a position of authority, supervision ought to consider any potential biases that might be held and affect the impact of the intervention for certain individuals.

Ryan Jackson (2018) highlights that leaders build capacity in those they supervise by continually balancing support with accountability to improve student outcomes. Leaders communicate a collective accountability when providing support to those implementing the intervention to achieve the implementation goals. They caution that there are many reasons to stop and go back to old ways of working, which those supporting the implementation can help prevent. Therefore, those supervising are accountable for identifying and addressing incorrect implementation behaviours to achieve fidelity. In a study of the Victorian Early Years Learning and Development Framework, Garvis (2013) reports that those activities most valued by staff to support implementation include sharing, collaborating, discussing, and reflecting upon their own practice, which supervision can provide. Hence, supervision involves elements of coaching, not just performance management.

What does the evidence tell us about how the strategy works well?

A range of evidence suggests how modelling from leaders and supervision may support implementation. This includes how leaders show their support for the intervention, the need for this support over time, knowledge about the intervention, and that supervision and modelling can be demonstrated in a range of ways.

Lane et al. (2022) analysed data collected from a mixed-methods trial of a physical activity intervention in Australian Primary Schools. The PACE intervention includes eight implementation strategies including modelling change, although this was labelled as mandating change in the analysis. It was considered the most important strategy by the majority of participants. Key messages from the analysis included the need for support from school leaders, including school leaders providing verbal commitment to the intervention in an initial meeting, sharing their support for the intervention, and that it was a school priority with the wider school community. This helped champions take ownership themselves and when there was not this support from a school leader, adoption was lower.

Arnold et al. (2021) conducted a qualitative study interviewing those involved in delivering a trauma-informed universal mental health intervention using interviews and reviewing fidelity logs. None of the 13 schools sustained using the intervention: one barrier to sustaining was that consultation and supervision came from research staff and thus ended after the research project. A plan was needed to maintain this support after research participation, with a school implementation leader recommended for times when there would be a transfer of modelling and supervision to the school.

Smith and Engelsen (2013) interviewed two school principals from Norwegian schools that had participated in a three-year project aimed at establishing an assessment for learning culture. This study provides evidence that school leaders should be involved in initial discussions about an intervention. For school leaders to lead implementation of a new intervention they need learn about the intervention to be able to support staff.

Veel and Bredhauer (2009) report qualitative analysis from case studies with two Australian principals who had implemented and supported teachers to use sustainable pedagogies in their schools. A key aspect of implementing sustainable pedagogies is shared ownership across a school community and this was something that school leaders reported they needed to demonstrate, through modelling, to show the value of partnership teams both in terms of learning what is important to the school community and communicating to them the sustainable ethos that the school will take.

Robinson and Gray (2019) reviewed research which investigated links between student outcomes and leadership. They provide evidence that teachers perceive leadership feedback to be useful if it is part of an ongoing supervision process, leadership are seen as experts, and have a good relationship with those they evaluate. Furthermore, feedback may be perceived as fairer and more useful if teachers are involved in planning their evaluation.

Albers et al. (2021) conducted an integrative review which describes the strategies and skills required by implementation support practitioners. Although not focused on schools, there are relevant messages about specific strategies used to model and simulate change, including role-plays, formal shadowing, participant modelling, and walk-throughs as options to consider. They provide evidence of their impact on building skills, e.g. those required to deliver an intervention and the adoption of implementation techniques by those supporting the implementation.

What does our realist review show are relevant contexts and mechanisms?

The programme theory applies to the strategies through implementation leaders, as *agents for change*, taking a leadership role in the implementation effort. They model, simulate, and/or supervise the behaviours needed in the implementation of the intervention, thereby *uniting* values inherent in the intervention, i.e. its meaning and relevance to those involved in its implementation. This can lead to the adoption and fidelity of the intervention.

ICAMO configuration for *Provide practice-specific supervision and Model and simulate change*

When attempting to change the behaviours of those involved in introducing a new intervention through modelling change and supervision, implementation leaders can act as Agents for Change. If leaders are demonstrating and seeking the change they need to see in others it shows their investment in the new intervention and advocates changes needed from others. Those staff in leadership positions will need an understanding and knowledge of the implementation

processes and the requisite implementation skills related to the intervention. If they do not have these attributes, then they will need to develop them. By leadership demonstrating their understanding, knowledge and skills through modelling, simulations and/or supervision, staff who are delivering the intervention are clear that the intervention is valued and in turn their contribution to implementation is valued too. Through modelling and feedback staff will be clearer on what actions are expected and learn the skills to implement it. This leads staff implementing the intervention to hold greater clarity about the intervention aims and procedure. This will have an indirect effect on fidelity, a more direct effect will be seen when supervision provides feedback on fidelity. Also, through modelling and supervision greater buy-in to the implementation effort is facilitated through making the importance of the new intervention clear.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 14: Provide practice-specific supervision; Strategy 30: Model and simulate change				
Model or simulate the change that will be implemented prior to implementation (Cook et al. 2019, strategy 30) and provide school personnel with supervision focusing on new practices (Cook et al. 2019, strategy 14).				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change –Those with responsibility and knowledge are demonstrating and encouraging those implementing towards the change needed.	Leaders and staff members who model and supervise implementation.	Uniting values through implementation behaviours needed in others modelled and simulated by leaders and supported by supervision.	Behaviours modelled are mirrored and feedback enacted improving fidelity. Through modelling and supervision, buy-in is enhanced. Adoption Fidelity Buy-in	Ryan Jackson et al., 2018; Albers and Pattuwage, 2017; Simmons and Martin 2016; Schildkamp et al., 2019; Hollingshead, 2009; Albers et al., 2021; Garvis et al., 2013; Gabby et al., 2017; Robinson and Gray, 2017; The Bill and Melinda Gates Foundation, 2013; Leis et al., 2017; Merle et al., 2022; Williams et al., 2021; Gaias et al., 2021; Lane et al., 2022; Veel and Bredhauer, 2009.
CERQual confidence rating: Moderate				

Summary

There is some promising evidence that modelling implementation can impact on fidelity and adoption. Supervision can also encourage adoption. Evidence includes strong beneficial findings from a review, although modelling here suggests a blurred distinction between modelling intervention and implementation-specific behaviour. Most of the evidence considers how modelling and supervision might be used by schools rather than showing the benefit of either of these strategies in isolation. Because there is likely to be variation in terms of how the strategy will be used and the prominence of school leaders as modellers of implementation and supervisors ranges across literature, this impacts on the coherence of this review finding and the ICAMO is rated as a moderate level of confidence.

17. Tailor implementation strategies

SISTER Strategy 17, ‘tailor implementation strategies’ (Cook et al, 2019) is further defined as tailoring strategies ‘to address barriers and leverage facilitators that were identified through earlier data collection’ (p. 922). It is categorised as a strategy which falls under ‘adapt and tailor to context’.

Definitions in the literature

Like other SISTER strategies—such as Strategy 12, ‘facilitation and problem-solving’—tailoring implementation strategies is closely tied to strategies associated with data collection and analysis. Tailoring strategies in response to the degrees of readiness of the school environment to implement an approach is considered key in amplifying the chances of early success (Calvert et al., 2020; Fixsen et al., 2005). Tailoring support and training in response to the needs of implementers is considered key in enabling staff to develop confidence and autonomy in implementation related practices (Hollingshead, 2009; Roach et al, 2009). Cook et al. (2019) argue that tailoring implementation strategies should involve an assessment of features of the intervention as well as aspects of the school context such as

support from leaders, protected time, or factors associated with the individuals who will put the intervention into practice—e.g., their self-efficacy, beliefs and attitudes, and intentions to implement. As such, this meta-strategy, relies on Strategy 1, ‘assess for readiness and Identify barriers and facilitators’, to help the selection, amplification, and tailoring of the most impactful implementation strategies for the interaction between the intervention, school, and people involved.

As one approach to tailored implementation involves targeting implementation strategies to specific barriers identified in a school context, it is helpful that academics have identified methods to inform tailoring implementation strategies to context; these include concept mapping, intervention mapping, group model building, and conjoint analysis (Powell et al. 2017).

To what extent does the evidence indicate outcomes?

While there is evidence from a range of study designs from reviews to qualitative studies about the potential impact of tailoring implementation strategies on several implementation outcomes, there are a couple of related caveats. Firstly, studies have not isolated adapting implementation strategies as a sole strategy to ascertain its impact relative to other strategies. Moreover, this strategy is broad and implies it is other implementation strategies that will be tailored and that this will differ according to context. In one setting, coaching may be tailored to support staff to improve their implementation outcomes; in another setting, a school may be tailoring incentives to feedback from the school community but not seeing great changes.

Moore et al. (2021) report the range of implementation strategies that were used in a trauma-informed prevention programme in 29 schools. They report on how planned implementation strategies were tailored in response to emerging barriers in the research trial. Tailored strategies included adding staff participation as part of data that was tracked, linking incentives to this participation, modifying pupil incentives in response to pupil feedback, and switching from group to one to one supervision. Alongside a range of other implementation strategies, participants reported impact on fidelity, acceptability, feasibility, and adoption. It is notable that in both this research study with implementation leaders, and when Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services, participants considered this implementation strategy as feasible but not as important as most other SISTER strategies.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. The paper reports that tailoring implementation strategies was a strategy that implementation teams used. It was something that coaches working with schools supported these staff with. Coaches worked with schools to use their data on readiness and ongoing assessments to tailor implementation; they encouraged ways to increase family and community involvement; and coaches also supported schools to build-in the use of existing resources in tailored implementation strategies. The study notes that data-use enabled informed tailoring implementation strategies. There were examples of schools in the study that collected data to assess the level of support for tailored implementation strategies they used.

The study also shows that the use of the Dynamic Adaptation Process (DAP), which suggests implementation strategies to provide flexibility to schools to modify interventions to fit their setting, can also provide a structured approach to using school-specific data to inform the decisions about implementation strategies schools take. The DAP affords flexibility for schools to modify and independently apply implementation strategies to help ensure that an intervention fits into their setting. The DAP was reported to help focus on the interaction between the intervention and the people involved by focusing on staff in the schools, parents, and pupils as the experts in the cultural fit of the intervention and therefore how all three of the intervention, school systems, and implementation strategies might be adapted. This improved the acceptability and fit of the intervention. This example shows the potential synergy between this implementation strategy about tailoring implementation strategies and strategy 16, Adapting an Intervention. The DAP encouraged selection and contextualising of implementation strategies that school stakeholders perceived would help the intervention be introduced in practice and sustained. The study also provides evidence that implementation strategies can be tailored for school context and therefore help to address potential inequities.

In a realist review of implementing health promotion programmes in schools, Pearson et al. (2015) report that the degree and characteristics of school-level support strategies also vary between the primary and secondary context due to the makeup of class dynamics, maturity, and timetabling. Strategies which are tailored effectively to the given school context are linked with higher degrees of implementer acceptability and feasibility as they speak to the needs of both implementers and the pupils who the intervention seeks to impact (Hall, 2013; Trapani and Annunziato, 2018). However, to increase implementation outcomes such as fidelity, changes to practice and support must be responsive to the core components of an approach (Reinke et al, 2021; Rowe et al, 2021).

In a review of facilitators and barriers of research-based knowledge in primary and lower secondary schools, Dyssegaard et al. (2017) report that intensive and targeted professional development supports implementation outcomes; this is enhanced when professional development support is tailored to meet school context and policies. This

review also noted that coaching is a particular implementation strategy with strong implementation outcomes that is particularly apt for being tailored to staff-specific needs.

In summary, a small amount of research that ranges in design from two reviews to two qualitative studies demonstrates some beneficial impact of tailoring implementation strategies on outcomes that include adoption, acceptability, fidelity, and sustainability. Studies have not isolated adapting implementation strategies as a sole strategy to ascertain its impact relative to other strategies and equally the kind of tailoring is typically unique to context and implies the use of other strategies to drive the outcomes indicated.

What does the evidence tell us about the situations in which schools might use this strategy?

Schools might use this strategy to respond to data collection about needs and readiness in order to inform the support that may be needed. Schools should identify barriers to implementation and therefore the need for support with these. While a range of implementation strategies are available, they can be tailored to the intervention or the school context (Evenhuis et al, 2021; Locke et al, 2016).

Tailoring strategies can be used effectively during early exploratory stages of implementation, for example, as a way of responding to SISTER Strategy 1, 'assess for readiness and identify barriers and facilitators', 23, 'conducting local consensus discussions', and Strategy 4, 'conducting local needs assessments' (Cook et al, 2019). During preparation for implementation, as well as at later points when data are analysed and implementation reviewed, schools can tailor implementation strategies in response to contextual circumstances.

Fixsen et al. (2005) indicate that during all stages of implementation, 'the speed and effectiveness of implementation may depend upon knowing exactly what must be in place to achieve the desired results' for stakeholders (p. 25). This refers to the symbiotic nature of the relationship between data and decision-makers within the school context, whereby staff use of data can enable effective or ineffective outcomes depending on the focus and strength of monitoring and evaluation.

What does the evidence tell us about how the strategy works well?

Using data to tailor implementation strategies enables implementers to become more empowered and informed in implementation practice. The selection of tailored implementation strategies may respond to different needs that implementers have.

Evidence suggests that leaders can use real-time data to establish ways implementation strategies can be tailored for implementers to help with empowerment, motivation, and feeling supported (De Brún and McAuliffe, 2020). This is important because it is also suggested that concerns, emotions, and questions might impede collective learning, therefore some tailoring of strategies might be necessary to address individual staff concerns (Schildkamp et al, 2019).

Research studies often report on implementation strategies tailored to the school context, rather than for the actors using them. Szeszulski et al. (2022) used a cross-sectional survey to measure the attitudes, barriers, knowledge, and outcome expectations related to the implementation of physical activity programmes in elementary schools. Part of their analysis focused on differences according to the job type of participating staff. Because knowledge about physical activities and perceived barriers differed between principals, physical education teachers, and other classroom teachers, the authors argue that implementation strategies may need to be tailored to the role of school staff involved in implementation. Specifically, physical education teachers are unlikely to share barriers of other non-specialist teachers and therefore different implementation strategies are needed to support staff with different intervention-related knowledge. The authors recommend implementation-mapping as a process for tailoring implementation strategies.

Similar implications are reported in a mixed-methods study by Sichel and Connors (2022) with school-based clinicians using a measurement feedback system (technologies that collect and report pupil health data to aid clinical decision-making) to identify determinants of practice. Clinician adoption and uptake of these technologies see numerous barriers. While the latent-class analysis identified clinicians who reported high versus low implementation outcomes such as appropriateness, acceptability, feasibility, and adoption, there were individual differences in clinician barriers, therefore implementation strategies ought to be phased, tailored for the organisation, and then target those with low implementation in a responsive way.

Indicated thus far is the importance of tailoring implementation strategies based on data collection to consider school context, barriers and even individual differences. This raises the question of how to collect this data and monitor any adaptations to implementation strategies. In the context of a school-based depression treatment Walsh-Bailey et al. (2021) developed and pilot tested three tracking logs that demonstrated encouraging data collection about acceptability, appropriateness, and feasibility to track the use of tailored implementation strategies as well as intervention adaptations.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Just as focused and in-depth data handling can enhance a school's ability to tailor implementation strategies effectively, unfocused and shallow data handling can limit the ways in which schools can use implementation strategies effectively

(van Geel et al, 2017; Schildkamp et al, 2019; Bohanon and Wu, 2020). Implementers' capacities to take a flexible and data-informed approach to implementation decision-making and practice is also thought to enhance or hinder the impact of tailoring implementation strategies. For example, schools can develop regular meeting spaces to discuss what data is suggesting around needs and next steps, cultivating data informed decision-making practices (van Geel et al, 2017). Increased time to analyse and consider data can increase capacities, helping staff to process the implications of data in systematic and meaningful ways.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold relevance to tailoring implementation strategies. *Enabling structures* facilitate the systems in which tailoring can take place, for instance the dedicated time for collecting and evaluating data in ways which inform decision-making (Fixsen et al., 2005). Data may include the identification of school context- and people-specific barriers and the ways in which staff and pupils negotiate and relate to content in relation to their own needs and goals (Dyssegaard et al., 2017; Hollingshead, 2009; Roach et al., 2009).

Our analysis indicates that *agents of change* across the wider implementation team facilitate the tailoring of implementation strategies through processes of *reflecting*. These processes include exchanging views, experiences, and preferences (Cannata and Nguyen, 2020). When integrated with objective data measures such as pupil attainment, or explicit recognition of the core components of an *intervention*, these forms of relational or subjective data, help to generate useful insights into how implementation needs to be tailored to have the most impact at the school level through addressing identified barriers (Schildkamp et al., 2019; van Geel et al., 2017). Although the intervention features are likely to predict implementation strategies that will be amplified or tailored, our evidence suggested that agents for change who can carefully design tailored implementation strategies are a key condition to purposeful reflection on what is needed to support implementation in a particular school context.

ICAMO configuration for tailor implementation strategies

Agents for change can tailor implementation strategies and in doing so may be able to alter resources and the school environment. Considering the links between the evidence behind an approach and the school context, local needs assessment, and consensus discussions helps to develop a configurative data picture, which helps establish the ways in which implementation needs to be tailored in response to needs to be delivered effectively in the school context. Agents for change therefore need to hold some agency and be empowered to identify and respond to support needs. The implementation team can examine school readiness by assessing the ways in which the school context may enhance or inhibit successful practice. Reflecting on data is key to ensuring that implementation resonates with the needs and priorities of the school context and that implementers can relate and respond to expectations in a feasible and accessible manner. Tailoring implementation strategies is a way of approaching change, both pre-emptively, to avoid barriers, and reactively, to respond to them. Tailoring strategies helps to prepare implementers and the school context for putting an intervention in place and can therefore help with feasibility and acceptability through targeting support and monitoring fidelity, helping to support greater sustainability over the long term.

Implementation Strategy 17: Tailor implementation strategies				
Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection.				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change: facilitate data gathering and support for other staff.	Implementation teams making decisions	Reflecting: on data and core components of an approach is key to ensuring that implementation resonates with the needs and priorities of the school context and implementers.	Feasibility Acceptability Fidelity Sustainability	Fixsen et al., 2005; Roach et al., 2009; Hollingshead, 2009; Dyssegaard, 2017; Van Geel et al., 2017; Schildkamp et al., 2019; Cannata and Nguyen, 2020; Moore et al., 2021; Gunderson et al., 2021; Szeszulski et al., 2022; Sichel and Connors, 2022.
CERQual confidence rating: Low				

Summary

There is evidence that tailoring implementation strategies and related activities are beneficial and linked to a range of implementation outcomes. There is more evidence focused on how and when implementation strategies might be tailored, rather than the impact of specific examples of this. Our realist analysis shows how agents of change reflect on a range of data to understand the ways in which implementation strategies need to be tailored to meet the needs of the school context. The ICAMO configuration is rated at a low confidence level. This is because while the evidence is clear and coherent, there are concerns about the design of studies and adequacy of the data as it rarely specifies how implementation strategies can and have been tailored and that it is this that leads to outcomes.

16. Promote adaptability

SISTER Strategy 16, 'promote adaptability' (Cook et al., 2019), is further defined as promoting adaptability as processes or actions taken to 'identify the ways a new practice can be tailored or adapted to best fit with the school/classroom context, meet local needs, and clarify which elements of the new practice must be maintained to preserve fidelity' (p. 922). It is categorised as a strategy which falls under 'adapt and tailor to context'.

Definitions in the literature

Promoting adaptability represents a balance between respecting the core components and theory of change of an intervention versus making intelligent adaptations that allow the intervention to be used in a particular school context (Stirman et al., 2019). The focus is on whether and how the intervention in question needs to be adapted to fit school context. However, despite the strategy's title, 'promote adaptability', the evidence suggests the focus in considering adaptation ought to equally be placed on what must be retained to stay faithful to the intervention so it will work as previously evidenced (Gunderson et al., 2021). Adaptations can be different kinds of changes: as well as modifications to an intervention, there may be additions or the removal of aspects of the intervention procedure to improve fit with the school context. The adaptations can also focus upon the school context, considering what might be changed within the school to also improve the fit between the intervention and the school in which it is being implemented (Gaías et al., 2021).

Considering adaptability subsumes a range of other implementation strategies that feed into this process. Indeed, Gaías et al. (2021) suggest that implementation strategies can be intentionally chosen to facilitate adaptation of the intervention to better fit the context—meaning decisions about adaptation ought to be informed by collecting and using data (Albers et al., 2021; Gaías et al., 2021). Therefore, this strategy may draw upon prior used strategies such as Strategy 1, 'assess for readiness to identify barriers and facilitators', as well as Strategy 23, 'conduct local consensus building', and Strategy 4, 'conduct needs assessments within the school community'. Other strategies provide a platform for carefully considering adaptation of an intervention and therefore the evidence reviewed here focuses upon the impact of adapting interventions in school settings.

To what extent does the evidence indicate outcomes?

Adapting interventions has been shown to improve implementation outcomes including feasibility, adoption, and sustainability across studies including several reviews. Interestingly, there is evidence that adapting an intervention can also increase fidelity.

Herlitz et al. (2020) conducted a systematic review of the sustainability of public health interventions in school settings. This included synthesising literature that show barriers and facilitators affecting sustainability. Insufficient funding, resources and/or physical space was shown to lead to adaptation. Evidence from eighteen reviewed studies suggested that sustaining an intervention in schools was affected by whether an intervention could fit into the time available, the action schools took was sometimes to remove parts of an intervention or incorporating it into existing curriculum or practice. Adaptation was also reported as important to match the intervention to students' needs. Finally, a unique finding, given the review's focus on sustainability, was the need for adapting intervention resources when they had become tired, both worn or dated.

A realist review which developed programme theories for the implementation of health promotion in schools evidenced two elements of adaptability which are more strongly linked to sustainability and feasibility of implementation (Pearson et al., 2015). These relate to the need to categorise programme elements into 'essential', 'optional', and 'adaptable'. This implies that essential elements—or what other research refers to as core components—should not be adapted and doing so can impact whether a health promoting intervention is sustained. Some programme elements can be adapted and it is important to identify these and consider how the school context may inform these decisions. However, it may be the case that some programme elements are not critical and the adaptation may aid feasibility and sustainability of the intervention by removing such optional elements. Secondly, the review highlights that although decisions about adaptation are focused on the intervention, there may be scope or a need for 'mutual adaptation' between the intervention and the people delivering it (Pearson et al., 2015, p. 14). This suggests the importance of considering how any carefully considered adaptations do fit with capacity and capability of staff involved.

Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional and behavioural needs. They found a large beneficial effect on fidelity from four studies that reported adapting the intervention to fit context as a strategy used. While this was only a small number of studies reviewed and this strategy was often used alongside others, this is strong evidence of the potentially surprising finding that adapting an intervention can improve fidelity.

Cassar et al. (2019) conducted a systematic review aiming to identify factors associated with the adoption, implementation, and sustainability of school-based physical activity interventions. They found that adaptability was one of seven facilitators for all three implementation outcomes (adoption, fidelity, and sustainability). There was a lack of detail reported in the review but a key finding was that adapting physical activity interventions is associated with increased adoption and sustaining an intervention in school practice; however, adapting an intervention can be both a facilitator or barrier in relation to fidelity. This adds further evidence to the importance of maintaining fidelity to the core components of an intervention while simultaneously making pragmatic adaptations which can help to ensure fit and feasibility with pupil need and school context. In their evaluation of Positive Action, a social and emotional learning intervention, O'Hare et al. (2018) reported that reducing the dose of the intervention could improve fidelity.

Furthermore, evidence suggests that schools should also consider how an intervention aligns with, and is adaptable to fit, overarching strategic goals of the school more broadly (Langford et al. 2015; Pearson et al, 2015; Ryan Jackson et al 2018; Tancred et al., 2018). If an approach can fit existing practices and reinforces strategic goals, studies suggest that schools are more likely to sustain the new practice and achieve the intervention goals despite challenges (Koh and Askell Williams, 2021).

In summary, four reviews and one mixed-methods study demonstrate the beneficial impact of adapting interventions on outcomes that include feasibility, adoption, fidelity, and sustainability. The evidence reviewed recognises that adapting an intervention impacts fidelity but that careful adaptation can actually improve fidelity to core components when the changes allow the approach to be more faithfully represented.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that strategies which promote adaptability are used in several capacities during implementation. These tend to focus on responding to feedback about an intervention and increasing acceptability.

Moore et al. (2021) report the range of implementation strategies that were used in a trauma-informed prevention programme in 29 schools. They show how minor adaptations can be made to an intervention based on feedback from students and staff delivering the intervention without changing the core components of the intervention. Examples provided included adjusting the length of intervention sessions to fit different participating schools' schedules. Alongside a range of other implementation strategies, participants reported impact on fidelity, acceptability, feasibility, and adoption.

Freeman et al. (2014) report teacher reflections from a qualitative study on the process of planning and introducing a whole-school conflict resolution-focused programme in ten primary schools. Adaptations that staff made included adding activities and adapting content for pupil needs; some schools also modified the curriculum so that it was relevant across the different primary school ages. Doing so was reported to increase the acceptability of the programme. This also indicates how barriers in other studies around an intervention not meeting pupil needs can be seen as an opportunity for adaptation.

Høstgaard Bonde et al. (2018) conducted an evaluative case-study examining the impact of 'We Act', a health-promoting school intervention comprising an educational, a parental, and school component across four Danish primary schools, and found that barriers to implementation fidelity included a lack of leadership support to provide time and space to plan and adapt practice and a failure to involve and engage pupil voice as part of this. The intervention was viewed by participants as having a poor fit with the plans for that school year and therefore not adapting the intervention was considered to impact fidelity. Furthermore, barriers to implementation were reported due to a lack of alignment between the core components of the approach and participants' reported need to be responsive to pupil needs. This indicates the importance of considering core components of the intervention alongside any plans to adapt. This finding implies adapting an intervention should enhance the fit of an intervention.

Schools may use items on the Organizational Readiness to Change scale to ask questions about elements which relate to promoting adaptability. These questions should focus on motivational readiness (need for improvement, training needs, pressure to change), institutional resources (space, staffing, training, computers, e-communication), staff attributes (growth, efficacy, influence, adaptability), and organisational climate (clarity of mission and goals, cohesiveness, autonomy, openness to communication, stress, openness to change) (Fixsen et al., 2005).

Albers et al.'s (2021) scoping review of implementation support strategies provides evidence which indicates actions that can promote adaptation. These included: (1) assess adaptation needs, (2) source evidence to guide adaptation, (3) translate and apply this evidence, (4) design adaptation, and (5) document, track, and assess adaptation results. The

review highlights that decisions about adaptation need to be mindful of target populations' needs, stakeholders' interests, priorities and preferences, and the availability of resources.

What does the evidence tell us about how the strategy works well?

Some evidence indicates the use of existing frameworks to guide adaptation. Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. The paper reports that promoting adaptability was a strategy that implementation teams amplified of importance, using it to allow for adaptations to meet local needs, which coaches helped teams to only make adaptations that still maintained fidelity to the interventions. Examples include adaptations to fit time constraints, the amount of available administrative support and changing the delivery of programme elements to generate enthusiasm from pupils or increase the relevancy to the school community. However, the study also shows the use of the Dynamic Adaptation Process (DAP) to combine several implementation strategies including needs assessment, use of implementation champions, and coaching as part of an overall approach to provide flexibility to schools to modify interventions to fit their setting and, equally, make changes to the setting to fit the intervention. The DAP provides a structured approach so that adaptations are not threatening fidelity. It also includes school-specific data to inform the decisions about adaptations and the approach to implementation schools take. The DAP was reported to help focus on the interaction between intervention and the people involved by focusing on staff in the schools, parents, and pupils as the experts in the cultural fit of the intervention and therefore how all three of the intervention, school systems, and implementation strategies might be adapted. This improved acceptability and fit of the intervention. This example shows the potential synergy between this implementation strategy about adapting an intervention and Strategy 17, Tailoring Implementation Strategies. The DAP encouraged selection and contextualising of implementation strategies that school stakeholders perceived would help the intervention be introduced in practice and sustained. Schools used implementation strategies based on the DAP such as Strategy 5, 'develop an implementation plan', and Strategy 18, 'test-drive and select practices', but often modified or amplified them to fit their school.

The three-step ASPIRE (Adapting Strategies to Promote Implementation Reach and Equity) Process for adapting equity-explicit implementation strategies (Gaia et al., 2021) suggests undertaking two connected processes to adapt implementation strategies through an equity lens. Firstly, 'identify the underlying assumptions' (p. 4): this refers to inquiries around why the implementation strategy is appropriate and who it aims to help and how, particularly in relation to promoting equitable outcomes. Secondly, 'identify potential sources of disparities' (p. 4): this refers to identifying and understanding roles and responsibilities, resource implications, choices around process and the implications of potential outcomes. When these steps are undertaken, Gaia et al. suggest that adaptations to the strategies which are selected and engaged during implementation 'ensure that equity is considered in the underlying assumptions and has the explicit potential to reduce disparities' (p. 4).

Evidence also suggests that exploring relationships between the intervention and wider curriculum can help to reinforce core components and context, such as where an intervention aligns with pupil needs and interests, which can help identify meaningful learning opportunities to create excitement and hooks to engage pupils (Fernandez et al., 2019; Gale et al., 2020). Fernandez et al. (2019) argue that intervention mapping can be used as an approach to systematically adapt evidence-informed interventions for new populations and contexts. Using intervention mapping for intervention adaptation and planning implementation is argued to aid adoption. See Belansky et al. (2013) for an example of implementation mapping for whole-school approaches to healthy eating and physical activity.

School stakeholders can approach fit and adaptability of an intervention through identifying the key goals or valued outcomes from the intervention (Leung et al., 2020), examining crossovers between goals, for example, between academic and wellbeing outcomes (Austin et al., 2011; Pearson et al., 2015), exploring which intervention components may be best suited to help facilitate progress toward goals (Aarons et al., 2011), by developing a common understanding around the components of an approach most closely linked to positive outcome (Trapani and Annunziato, 2018), and fostering the skills of those tasked with implementation (Evans et al., 2015). As skill development and balancing fidelity and adaptability are both facilitators of implementation (Bingham et al., 2018; Gale et al., 2020), this may imply a need to ensure implementation leaders can identify indicators of fidelity (to core components) and adaptability (feasibility and reliability). This may help to support the processes of breaking down an intervention into actionable steps underpinned by a common language around implementation (Goldenthal et al., 2021).

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

There is evidence that adaptability can be both a facilitator and a barrier. Therefore, careful consideration of adaptability and when adaptations can and should be made is important.

An understanding of the concept of diffusion maybe useful when considering the implications of promoting adaptability. Hung and Lee (2015) propose that educational settings cannot undertake implementation without considering learning processes, equity, and diversity amongst students receiving an intervention. Rogers' (2003) Diffusion of Innovations theory assumes that an intervention is almost never a perfect fit for the organisation in which it is being implemented and therefore as the new practice spreads across the school it is bound to be shaped to fit the school. Planning ahead

for adaptations that facilitate this scaling up of an intervention is needed, as opposed to viewing adaptation as a barrier to be controlled.

Eisman et al. (2022) conducted a mixed-methods study to examine implementation determinants for the Michigan Model for Health, an evidence-based curriculum. Their findings situate adaptability in relation to other domains of acceptability and intervention-context fit, suggesting that adapting the curriculum was a response to lack of perceived fit and helped improve acceptability. The finding that particularly adds to other evidence is the identification of barriers to adapting an intervention, even when this was perceived to be necessary. While teachers felt the curriculum was adaptable and made changes based on their context, teaching style, and teaching experience, some teachers wanted to adapt the curriculum to support pupils exposed to trauma. This suggests the importance of understanding the intervention aims and purpose, as well as its limits, particularly as not being able to adapt the curriculum for the needs of current students lowered acceptability and risked teachers stopping using it.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms all hold relevance to promoting adaptability. The level of adaptability of an intervention is a key *intervention feature* and therefore the features of an intervention inform how much adaptability can be promoted. *Enabling structures* facilitate the systems in which adaptation can take place, for instance the dedicated time for planning or collecting and evaluating data. *Agents for change* act in ways that help to change practice based on *reflecting* on the needs of individuals, groups and the broader vision or direction of the school, including involving and *engaging* a variety of voices across the school context in processes of change.

However, our analysis identified that when approaches to promoting adaptation are balanced between adherence to core components of an *intervention* and making intelligent adaptations informed by contextual circumstances, this is linked most strongly to a range of implementation outcomes including acceptability, fidelity, and sustainability (Fernandez et al., 2019; Herlitz et al., 2020; Gale et al., 2020). The feasibility and perceived adaptability of an intervention is important, as well as having identifiable core components. *Uniting* understanding around the core components of an approach helps to ground adaptations around evidence-based practice, amplifying potential learning outcomes for pupils (Cannata and Nguyen., 2020; Gale et al., 2020). The process and decision-making involved in considering adaptability can help *unite* members of the school community, not just in terms of valuing the intervention but broader implementation climate as staff can improve understanding of evidence and express professional judgement (Pearson et al., 2015). This in turn can also generate greater degrees of agency (ownership of own role in implementation) and active engagement with evidence behind core components of an intervention (Koh and Askell-Williams, 2021).

ICAMO configuration for promote adaptability

When preparing to implement an intervention, attention to the evidenced based core components integrated with local needs assessment can help staff to explore whether, and identify how, to adapt the intervention. The intervention features of adaptability and fit with school context provide the conditions for any adaptation. Moreover, considering the ways in which the school environment and current practice is aligned to the goals of the intervention informs adaptations. When implementation teams work alongside other implementers to unite knowledge about core components and how these are linked to positive outcomes, this can help to ensure adaptations do not come at a cost to fidelity. Greater understanding of the evidence behind core components helps those implementing to unite around the benefits of the new approach over existing practice. This facilitates a greater balance between fidelity and adaptation, sometimes indicating that adaptations can improve fidelity. Promoting adaptability in this way also holds potential to sustain the intervention as the intervention is both more likely to fit with the school context but see beneficial intervention outcomes through fidelity to core components.

Implementation strategy 16: Promote adaptability				
Identify the ways a new practice can be tailored or adapted to best fit with the school/classroom context, meet local needs, and clarify which elements of the new practice must be maintained to preserve fidelity.				
Context	Actor	Mechanism	Outcome	Evidence

Intervention features: Data reviewed and intervention understood allowing attention to core components, fit with the school setting, and how best to adapt practice.	Implementation teams guiding those who may be considering adaptations.	Uniting: familiarising staff with core components and how these are linked to positive outcomes can help to improve fidelity. Working to unite understanding of the approach in relation to the needs of pupils, staff and school context helps staff to make intelligent and informed adaptations which ensure relevance and fit.	Facilitates a greater balance between fidelity and adaptations. Acceptability Fidelity Sustainability Pupil outcomes	Koh and Askill-Williams, 2021; Cannata and Nguyen, 2020; Pearson et al., 2015; Herlitz et al., 2020; Savage et al., 2011; Fernandez et al., 2019; Gale et al., 2020; Merle et al., 2022; Cassar et al., 2019; Freeman et al., 2014; Høstgaard Bonde et al., 2018; Gunderson et al., 2021.
CERQual confidence rating: Moderate				

Summary

There is evidence that promoting adaptability can be beneficial and linked to a range of implementation outcomes. Adapting interventions needs to be considered in relation to fidelity to the core components of an intervention. However, considered adaptations can improve both acceptability and fidelity. Adaptations should be well planned and informed by data from a range of stakeholders. Our realist analysis shows how attention to core components, needs assessment, and adapting practice to aid fit helps to develop feasible approaches that will be acceptable and sustained. The ICAMO configuration is rated at a moderate confidence level. Several reviews inform the analysis and papers are relevant to this strategy, however, there are minor concerns in relation to adequacy of evidence for the finding because adaptations might look very different across different contexts. The strategy cannot be considered in isolation as it is informed by other data collection that can inform adaptations.

53. Remind school personnel

SISTER Strategy 53, 'remind school personnel', recommends that systems to remind school staff are developed to help recall key information about the intervention and prompt to deliver core components. These reminders might be direct and often electronic communication to individuals, like emails, or may be visual cues in classrooms or around the school. Developing a system which effectively communicates reminders to staff is therefore relevant in considering how to sustain a new intervention that has been introduced.

Definitions in the literature

Reminders are prompts to engage in expected intervention behaviour provided before the behaviour is expected to occur (Fallon et al., 2018). Implementation reminders may include a description of key intervention components, advice about challenging aspects of delivery, and reiterate the importance of consistent implementation (Fallon et al., 2018). Across the literature, reminders typically focus on either reminding or prompting fidelity to core components of the intervention (Botvin et al., 2018). Sometimes they encourage self-monitoring through use of checklists (Oliver et al., 2015). Reminders can be used later as a prompt to maintain fidelity over time or more broadly as a reminder that the intervention is still valued and expected over time and therefore related to sustaining the intervention (Leadbeater et al., 2015). Reminders can also help staff to feel connected to the intervention and therefore may target buy-in (Lohrmann et al., 2008) or adoption (Baffsky et al., 2023).

To what extent does the evidence indicate outcomes?

A range of quantitative evidence, although often from small trials, suggests the impact of reminders and prompts on fidelity. There is variation in terms of whether reminders are passive or prompts involve self-monitoring and therefore provide data about fidelity to those implementing an intervention.

In a randomised trial, Botvin et al. (2018) assessed whether an enhanced training and technical assistance package increased fidelity of the use of a school based drug abuse prevention programme called LifeSkills Training compared to access to the programme with typical teacher training. Two of a range of strategies used in the fidelity enhancement condition were just-in-time email reminders and fidelity checklists. The emails were sent a few days ahead of specific

lessons delivered as part of the programme and reminded about the importance of fidelity, reviewed key objectives of the lesson, offered tips about teaching methods, and reminded teachers to allocate necessary time for the session activities. The checklists were designed to self-evaluate but would have also served as a reminder of goals, objectives, and activities for each lesson. The fidelity enhanced condition schools increased fidelity in terms of adherence, dose, and quality compared to schools without these implementation strategies. However, these email reminders were used in combination with other support such as further professional development and technical assistance via a website. We cannot conclude that the just-in-time emails and checklists improved fidelity in isolation, but they show promise and indicate a way in which reminders designed to enhance fidelity can be structured and delivered.

Collier-Meek et al. (2017) aimed to isolate the impact of prompts on teacher fidelity in a multiple baselines study with four teachers who were putting into practice a whole-class behaviour intervention. The emails were sent for two weeks subsequent to a period of delivering the intervention after initial training. Emails included a table that listed intervention steps, tips for implementing each step, and scripts the teacher might use. Fidelity improved after email prompts for three of the teachers. The teacher where email reminders did not impact fidelity had not delivered the intervention consistently after training. This suggests that email reminders may help to maintain fidelity rather than encourage a teacher who is not ready to adopt the intervention fully.

Fallon et al. (2018) took the above study further, assessing the impact on fidelity from emailed prompts and later performance feedback in a further study with different teachers. Three elementary school teachers delivering a class-wide behaviour management intervention received initial training and then when fidelity was lower than 80% on two occasions in a week received a week of email prompts from consultants and then up to two weeks of performance feedback. While performance feedback led to greater mean gains in fidelity, the prompts still increased fidelity compared to after initial training and were rated as more acceptable than feedback from teachers and were quick to provide.

Oliver et al. (2015) examined whether teachers' use of a self-monitoring checklist helped to maintain their fidelity in using the Good Behaviour Game intervention. Teachers completed initial training and received performance feedback from an observing researcher until teachers received 100% fidelity scores for a minimum of five days. Then teachers used the intervention with a self-monitoring checklist rather than performance feedback. The researcher randomly observed or checked the completed checklists on some days but not all. All teachers were delivering the intervention with 100% fidelity in this self-monitoring phase suggesting that after initial training teachers could accurately rate their level of fidelity and suggesting that the checklist may have prompted this fidelity and clearly maintained fidelity compared to when performance feedback was received.

Bishop et al. (2015) conducted a small single-subject experimental design with three early years teachers to consider the impact of video self-monitoring, where teachers viewed video of themselves implementing embedded instructional learning in their classrooms and completed a self-evaluation. Sustaining use of the intervention was an issue across teachers. The authors conclude that there was a need for reminders for teachers to continue self-monitoring.

In summary, five quantitative studies, although often small scale, show the beneficial impact of providing reminders to implementers on outcomes that include fidelity. The evidence reviewed suggests that often reminders encourage self-monitoring so may improve fidelity because they are encouraging implementers to measure this.

What does the evidence tell us about the situations in which schools might use this strategy?

A few included studies indicate the necessary conditions for reminders to enhance adoption and fidelity in particular. Reminders rely on a certain amount of self-monitoring by those delivering an intervention and, if the knowledge or intention to use an intervention is not in place, reminders are unlikely to overcome these barriers. Fishman et al. (2017) conducted two longitudinal observation studies of teachers working with four different evidence-based practices for students with autism. They considered teachers' intentions and whether this matched adoption and fidelity of the interventions. The study concludes that implementation strategies need to consider whether their goal is to strengthen teacher intentions or to act on already strong intentions, reminders are given as an example that will help 'well-intended teachers act accordingly' (Fishman et al., 2017, p. 392). Similarly, Holmes et al. (2022) reported that prompts and reminders should follow professional development to increase awareness, knowledge, and motivation that helps to ensure responsiveness to reminders. These authors studied engagement with training to use the Incredible Years teacher classroom management programme as part of data from a large RCT.

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. Reminding school personnel was one of 37 implementation strategies used by stakeholders including researchers and school staff. Emails, texts, and phone calls were used by project staff suggesting that emails are not always the format used. They also made sure that when staff were planning sessions they reviewed core content and learning objectives for the intervention.

Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services about the range of SISTER implementation strategies. They rated reminders as one of the most feasible implementation strategies for use in schools. However, they did not rate its importance. The authors suggest that reminders may be considered particularly feasible as they are simple practices and not resource intensive. It is also suggested that

consultants may be familiar with interventions such as Positive Behavioural Interventions and Supports (PBIS) that include reminders as part of intervention resources. The strategy would be more resource intensive if reminders or checklists needed to be developed.

What does the evidence tell us about how the strategy works well?

Weiland et al. (2018) conducted a review of five trials of the strongest hope model, a preschool curriculum to identify the features that are common when preschools are using the curriculum with fidelity. In four of the five trials, the curriculum provided example scripts for teachers to use alongside instructions. While this might appear to be a feature of the intervention, the authors note the intention of the scripts—not as an indicator of fidelity according to how much teachers read, rather as a physical reminder that prompts teachers about what needs to be covered and therefore like a checklist. The least scripted of the five curricula, Tools of the Mind–Play, showed the lowest level of fidelity.

The strategy about reminders is focused on enhancing fidelity to core components. However, there is some evidence that different kinds of reminders may be used at other implementation phases to remind staff that the intervention is still important in relation to other competing demands. For instance, in Leadbeater et al.'s (2015) longitudinal qualitative study that explored how well a programme focused on preventing peer victimisation in elementary schools was adopted and then sustained over two years, examples were given of reminders such as principal's visiting classrooms at the time the intervention should be running. Also, one principal described how they would take one session per month to show that sustained focus on the programme by both teachers and pupils is expected. There were also examples of how support staff received reminders to organise and monitor the use of resources and this led to support staff taking a more active role in updating key staff about the status of the programme.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. School staff used reminders without being directed to use this strategy as part of the implementation support provided to schools. This study revealed it was the implementation resource teams who decided to remind school staff and that results were mixed in terms of reminders stimulating action.

Chen et al. (2018) evaluated the feasibility of an implementation framework to increase the capacity of U.S. school leaders to implement a childhood obesity prevention programme in their schools. A range of quantitative measures were used to measure fidelity, changes to the school environment, and student acceptability. Fidelity was relatively high, although student engagement varied over time. Reminders were promotional materials for schools to promote awareness and posters to reinforce lessons. Although these strategies were not considered in relation to outcomes and schools chose whether to use these materials, it shows how reminders may raise awareness or supplement intervention targets rather than only fidelity.

Dimova et al. (2021) conducted an EEF-funded efficacy, impact and process evaluation of Maximising the Impact Teaching Assistants. In part because staff turnover was found to be a barrier to implementation in some case study schools, an implication raised was the need for booster training which could help maintain buy-in and remind staff about the intervention and share effective practices. This shows how reminders may be a part of professional development.

Dariotis et al. (2017) interviewed both pupils and classroom teachers about their perspectives regarding a 16-week mindfulness and yoga programme running in their elementary schools. Programme delivery factors included barriers around resources that would prompt use of the intervention in classrooms. While this is like strategies around educational materials (SISTER Strategies 41 and 42), teachers recognised that prompts available in the classroom, such as posters or a summary of the curriculum, would be a helpful reminder of programme techniques.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to reminders because reminders or prompts need to be supported so they can be communicated and reach staff. The *intervention features* are also relevant as more complex interventions might need more reminders or prompts. Interventions with clear core components and that have resources that include reminders or checklist will aid the use of this strategy. Reminding school personnel of key aims, timeframes and core components can be a way of *engaging* implementers (Schildkamp et al, 2019; Albers et al, 2021; Metz et al, 2021). The mechanism of *uniting* is relevant as reminders and prompts help re-align values and commitment to an intervention, particularly when used once the intervention has already been delivered with fidelity to date. However, underlying engaging reminders and prompts and therefore driving outcomes is the opportunity for staff to *reflect* on how they are using an intervention and consider information and data, whether formal or informal, that speaks to the fidelity with which they are delivering the core components of the intervention.

Our realist synthesis indicated the interaction of enabling structures and reflecting on reminders to impact fidelity and help sustain intervention practice over time. This is indicated in the ICAMO configuration below.

ICAMO configuration for remind school personnel

This strategy demonstrates the enabling structures context. It is important for schools to identify a reminder system that will allow reminders to reach staff who are delivering the practice. The system should be one that staff actively engage with/view. Schools will therefore choose different reminder systems as appropriate (e.g. using email, staff room notice board, verbal prompts, virtual workspaces). This strategy will be actioned by implementation teams/leaders and engaged with/targeted towards all staff members delivering the intervention. Providing reminders of the interventions core components prompts deliverers to reflect on their implementation of the intervention and how close their practice is to the ideal delivery of intervention components. The strategy therefore promotes the mechanism of reflection. This strategy is one way to improve or maintain the fidelity of and intervention and sustain this over time. When used earlier in implementation phases this can impact adoption and buy-in.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 53: Remind school personnel Develop reminder systems (e.g., email prompts or visual cues) designed to help school personnel recall information and/or prompt them to deliver core components of new practices.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures (strategy indicates a system that is established to support staff).	Implementation team/senior leader and those delivering.	Reflecting (ongoing nature of the strategy indicates that it is about reflecting on training and implementation of practices periodically).	Fidelity Adoption Buy-in Sustainability	Weiland, 2018; Botvin et al., (2018); Collier-Meek et al., 2017; Fallon et al., 2018; Oliver et al., 2015; Bishop et al., 2015; Dimova et al., 2021; Dariotis et al. 2017.
CERQual confidence rating: Moderate				

Summary

A range of quantitative evidence, although often from small trials, suggests the impact of reminders and prompts on fidelity. More evidence from early years settings was located in relation to this strategy than others. Outcomes may be stronger when reminders are prompting self-monitoring on fidelity; more passive reminders may aid adoption and buy-in. As a range of evidence supports the use of reminders and prompts, we rate the ICAMO as moderate confidence, although it assumes that the reminder is presented in a way that encourages active self-monitoring, which was not always coherent in the evidence we located.

54. Targeting/improving implementer well-being

SISTER Strategy 54, 'targeting and improving implementer wellbeing', is categorised by Cook et al. (2019) as 'support educators'. It is described as supporting school personnel to reduce stress and burnout to promote their wellbeing and behavioural intentions to implement new practices.

Definitions in the literature

Stress, burnout, and excessive workload are some of the terms used to describe the potential negative impact for school staff if implementing a new intervention is perceived and experienced as a burdensome addition, rather than an alternative to current practice that will address priorities that are shared by implementers to improve outcomes (Roney and Daftary, 2020). There is a shared responsibility across school leaders and implementation leaders to consider these negative outcomes and mitigate against them for colleagues (Durand et al., 2016).

To what extent does the evidence indicate outcomes?

There is evidence that targeting implementer wellbeing can indeed improve their wellbeing and have an impact on fidelity. Few studies show an impact of direct action on wellbeing whereas a range of reviews establish wellbeing as a barrier to implementation that therefore needs more evidence about strategies that can address this.

While most of research evidence we located indicates teacher stress and burnout as a barrier to implementation outcomes, Larson et al. (2018) conducted a small multiple baseline design study with four teachers to test whether a strategy designed to promote teacher wellbeing would both reduce teacher stress and improve the fidelity of their delivery of evidence-based behaviour interventions. The intervention, called ACHIEVER, was a resilience curriculum delivered via coaches. Findings from four teachers who were experiencing a high amount of work related stress in an urban elementary school indicated reduced stress due to workload and improved fidelity in delivering classroom-based behaviour interventions. The findings suggest that attending to implementer stress due to work overload represents an implementation strategy that can target wellbeing directly but also holds promise to improve pupil outcomes through enhancing fidelity.

Goldenthal et al. (2021) report on an evaluation of acceptability, fidelity, and utility of a model to increase the knowledge, skills, and resources that clinicians require to implement an intervention in school settings. A mental health consultation team from a paediatric teaching hospital worked with school district leaders with the goal to increase the implementation, quality, and sustainability of Anger Coping, a targeted intervention aiming to address reactive aggression and disruptive behaviour in schools. Check-ins in the form of monthly conference calls were intended to monitor and alleviate anxiety and stress clinicians may feel. Calls also allowed reminders and peer-to-peer learning so may hold benefits related to other strategies. However, calls were not well attended and it is not clear whether those attending were more stressed or if they improved levels of anxiety or stress.

Wolk et al. (2019) adapted and piloted training on working effectively in a team based context for U.S. school mental health teams. An element of the training was situation monitoring, which encourages team members to be aware of what is happening around them and involves assessing situations to gain or maintain understanding of the situation in which a team is functioning. It was reported to allow identification of staff who appeared stressed, and because of the nature of the team-based interventions could inform allocation of pupils who may be causing the stress or amplify it. However, teamwork perceptions were not impacted by the training and measures of provider burnout significantly increased from prior to training to follow up. However, this may be due to differences in burnout and stress between summer break (prior to training) and follow up (midway through the school year).

Derrington (2015) explored principals' perceptions of their experience during the implementation of a teacher evaluation system in one U.S. state. The qualitative findings indicate that principals need to understand a new system well so they can support teachers. In this case they lacked understanding as training was brief. The system being implemented changing over time was further concern that increased stress for them and the staff that they wanted to support through change. One participant recognised that a pilot would have assisted the collective stress and avoided the fear of constant change. This study therefore indicates the need for school leaders to be informed about the intervention and potential issues, as they are likely to be addressing staff wellbeing concerns; it also indicates the need for assessing readiness and preparation in advance of delivery.

Evans et al. (2015) interviewed programme stakeholders in secondary schools in Wales where a social and emotional learning (SEL) intervention was implemented focused on how the intervention diffused across schools. Focusing on decisions to sustain or de-implement the intervention, a key factor related to burnout was how well-shared the impact and responsibility for the intervention was across staff. Over-reliance on key individuals, rather than shared responsibility, led to burnout and reluctance to sustain the intervention. This meant that three schools discontinued the intervention.

In summary, one quantitative study, one mixed-methods study, and two qualitative studies demonstrate some beneficial impact of improving implementer wellbeing on outcomes that include fidelity, as well as showing associated improvements in wellbeing. The evidence reviewed more often shows the negative impact on outcomes when implementers report stress and burnout.

What does the evidence tell us about the situations in which schools might use this strategy?

There is evidence that wellbeing needs to be targeted in research ranging from behaviour, changes to school scheduling, and local authority reforms. However, the lack of evidence about how the strategy can be operationalised means we do not know if some situations hold greater need for the strategy. The implementation phase may be important too, with evidence that putting a new intervention into practice may be a timepoint with more burden than when sustaining an intervention.

Review evidence demonstrates that stress, burnout, or excessive workload are implementation barriers. Staff burnout was seen as a barrier to high quality fidelity in an integrative review of implementation barriers to restorative approaches to improve discipline in U.S. schools (Roney and Daftary 2020). A systematic review of education interventions to reduce substance use and/or violence found five studies where teacher workload and/or burnout were linked to aspects of the curriculum content not being taught and therefore low levels of fidelity (Tancred et al., 2018). A study of school-wide positive behaviour intervention and support (SWPBIS) found a lack of wellbeing amongst staff was a barrier to adoption of the approach (Tyre and Feuerborn 2017).

In a multiple case study design, Wilcox and Lawson (2018) investigated teachers' experiences with the simultaneous implementation of three interventions as part of state-wide reforms, including learning standards, data-driven instruction,

and performance reviews. They report that when teachers experience emotional stress and fatigue during implementation this can diffuse to other staff. In these cases, differences in social and relational aspects of teachers' work are pronounced. Isolation from peers, excessive paperwork, perceived negative impact on student performance, and staff turnover were linked to increased stress and burnout, which in turn reduced adoption of the new interventions.

Salvaterra et al. (1998) observed leaders in U.S. high schools implementing block scheduling (90-minute lessons from 45 minutes) and found teachers in their schools had personal concerns that included how their family and leisure time reduced, and levels of stress increased due to the change of teaching style to accommodate the new class schedule. In one school—where mastery learning was a further innovation added before teachers were committed or confident in the change in practice necessitated by block scheduling—extreme stress was experienced by teachers, leading them to not adopt mastery learning and reject Block Scheduling despite it having been viewed as a success for many teachers. In an EEF evaluation of the Good behaviour Game, Humphrey et al. (2018) found implementation of the game resulted in more strain on teachers and on the school in general, particularly when staff left, and inexperienced staff were involved.

Durand et al. (2016), in a multiple case study examining school district leaders' orientations and strategies associated with state-mandated implementation of the Common Core State Standards, found that leaders allowed for flexible timetables to protect school principals and teachers from the stress of rushed implementation. Time was given to allow for teachers to plan together and for professional development, which helped to protect teachers from stress related to implementing the standards.

The majority of the evidence we found indicated stress and burnout were factors in implementation outcomes, however, Livet et al (2017) did not find this in their exploration of what matters most to sustaining the use of a mental health innovation Centervention. From the 44 school providers they surveyed they did not find evidence that organisational stressors such as workload influenced teachers' decisions to sustain use of Centervention. They suggest that teachers' routines to accommodate use of Centervention into their daily practice developed over time due to their long term commitment to it. This study suggests that risks to wellbeing may differ between phases of intervention, with more risk at the point of initial adoption, compared to factors that enable sustainability, although the authors conclude that this will be particular to the intervention.

What does the evidence tell us about how the strategy works well?

Some evidence suggests that the strategy may work well when it either fosters collaboration or provides autonomy for individuals. Kilgallon et al. (2008) conducted a qualitative study of early childhood teachers' perceptions of key factors impacting their implementation of mandated changes in schools. Staff reported benefitting from being able to collaborate with professional colleagues and learn together; this was reported to help half of the participants cope with change. Colleagues were reported to provide moral support but also advice and guidance. Developing a team approach strengthened capacity and encouraged a supportive work environment. Finally, staff having more autonomy and control in selecting which interventions they wish to work on was interpreted as improving empowerment and wellbeing. This study suggests that some processes to support wellbeing may not be discrete strategies but more contextual conditions in place focused on implementation and avoiding burnout and maintaining wellbeing that are not intervention specific.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to targeting/improving implementer wellbeing as it appears that extra resource in terms of time and additional support can alleviate or prevent difficulties with stress that are predicted when implementing an intervention. *Agents for Change* are important as school and implementation leaders will need to be perceptive to the levels of stress experienced by staff, although they will need enabling structures to respond as necessary. *Intervention features* will be relevant to consider as the evidence tends to be focused on mental health interventions themselves and educational reforms suggesting that the type and scale of the intervention is likely to play a part, as well as the fit with current practice. *Engaging* staff in discussions about their wellbeing is an important consideration which is acknowledged in some of the literature. While leaders can identify issues related to wellbeing and burnout, *enabling structures* that can engage staff to pre-empt and respond to this is important for several implementation outcomes, whether through specific strategies or broader collaboration, autonomy, and shared responsibility. Targeting and improving wellbeing can help *unite* values around what is important and expected in implementation, although this tends to be an outcome, rather than engaging staff to be able to target wellbeing in a particular context which would change outcomes.

Our realist synthesis indicated the interaction of enabling structures and engaging impacting adoption, fidelity, and sustainability as indicated in the ICAMO configuration below.

ICAMO configuration for targeting/improving implementer wellbeing

Enabling structures are needed to target and improve implementer wellbeing. Enabling structures that can support wellbeing, like time and resources, can affect wellbeing as well as other implementation outcomes. Leaders at the school

and implementation levels will need to be perceptive about the impact of implementation on stress and burnout and appreciate how this may change over phases of implementation and see individual differences for teachers. To achieve this, leaders will need to engage with the staff, listen to, and respond to their concerns and needs. Engagement related strategies include check-ins such as conference calls with implementing staff, ongoing formal communication meetings, consultation and booster training, and pilots to iron out concerns. Engaging in relation to this strategy may also be more indirect and consider distributing the burden of implementation more evenly across staff and addressing competing needs. Staff can also be engaged in determining and planning for a new intervention as this ownership, autonomy, and teamwork may relieve later feelings of overload. With this understanding, strategies can be developed and put in place that align to the emotional needs of implementing staff. Wellbeing is primarily addressed, although evidence suggests this can enhance the adoption, fidelity, and sustainability of the intervention.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 54: Targeting/improving implementer wellbeing				
Supporting school personnel to reduce stress and burnout in order to promote their wellbeing and behavioural intentions to implement new practices.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures: Time and resources needed to prepare and deliver the intervention. Systems to identify specific support needs.	School and implementation leaders target wellbeing. Staff communicate needs.	Engaging voices: Includes informal and or formal communication, consultation, booster training, pilots and recognition of competing needs.	Adoption, fidelity. and sustainability. Pupil outcomes.	Goldenthal et al., 2021; Wolk et al., 2019; Derrington, 2015; Larson et al., 2018; Evans et al., 2015; Hodgen et al., 2019.
CERQual confidence rating: Low				

Summary

While a range of evidence shows how stress and burnout amongst implementing staff can be a barrier to adoption, fidelity, and sustainability and therefore negatively impact implementation across phases, only one small scale study shows the impact of targeting and improving implementer wellbeing directly. This evidence suggests that there will be a range of ways of doing so, although enabling structures for this and engaging staff to identify needs will be important. Because of concerns about the adequacy of evidence contributing to this review finding, the ICAMO has a low confidence rating.

61. Alter and provide individual- and system-level incentives

SISTER Strategy 61, 'alter and provide individual- and system-level incentives', is categorised by Cook et al. (2019) as a strategy to use financial strategies. It is described as providing individual- and/or system-level incentives to districts or schools to participate and engage in implementing a new intervention.

Definitions in the literature

Incentives can come in many forms and therefore are not always financial as is implied by Cook et al. (2019). They may include recognition, funding to use the intervention, support, intervention resources, and professional development (Austin et al., 2011; Blaine et al., 2017; Evans et al., 2015; Williams et al., 2021). Indeed, examples of individual-level incentives given by Cook et al. (2019) include recognition and acknowledgement and gift cards. System-level incentives include grant money, free training, and consultative support. However, there may be some crossover between what is considered an individual- or system level-incentive, with system-level incentives used to help individual school staff.

To what extent does the evidence indicate outcomes?

There is evidence that providing incentives can improve buy-in and adoption as an implementation outcome. Incentives imply that individual behaviours can be positively influenced (Austin et al 2011; Hollingshead 2009; Jago et al 2015; Williams et al 2021). However, there is mixed evidence as to whether particular incentives will reliably enhance adoption of new approaches. This appears to be because incentives may not motivate all individuals in the same way and often incentives are used alongside other key implementation strategies such as professional development, reminders, and champions, which may themselves be driving outcomes. Likewise, evidence that incentives impact on fidelity and sustainability is mixed.

Few studies have explored the potential impact of providing schools and staff with financial incentives for implementing new approaches. However, there have been some U.S. school improvement models that have included an element of performance pay that provides relevant evidence. In their mixed-methods evaluation of a whole-school improvement programme delivered over four years, Kaimal and Jordan (2016) found there was some improvement in pupil outcomes in all schools, but it was unclear whether this was due to the increase in teacher salary, incentives based on pupil attainment, or teacher observation performance. Indeed, the authors found that those implementing interventions viewed their end of year financial payments as a 'reward' for past work rather than as an 'incentive' for the future. In this study, pupil achievement was not sustained over the four years and there was no impact on teacher retention, which also suggested that the incentive was not operating as intended. The researchers concluded that financial incentives have limited effectiveness and teachers placed more value on the professional community established through the programme.

Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional, and behavioural needs. They found a large beneficial effect on fidelity from eleven studies that reported reinforcement as a strategy used. Reinforcement ranged from praise to meeting cancellation to facilitate time spent on the intervention.

There is evidence that system-level financial incentives have supported implementation in several research studies. Blaine et al. (2017) used mixed-methods to investigate implementation outcomes for a childhood obesity prevention intervention in a low-income U.S. school district. Findings showed that programme training was funded by the research grant and where necessary some schools also received indoor play equipment so they could promote active indoor play. These authors concluded that the financial support for attending training increased attendance at training and sustainability of the intervention. Although research is lacking that specifically tests the impact of covering the costs of professional development and intervention equipment, this is often used by researchers to incentivise participation by schools and therefore indicates impact on adoption as an implementation outcome.

Similarly, Evans et al. (2015) completed a process evaluation to explain the adoption, delivery, and discontinuation of the Student Assistance Programme, a social-emotional learning programme across four Welsh schools. They found that intervention financial incentives from the local authority were used for training and resources, which were viewed by senior managers as important to its adoption.

Dass (2001) provides some evidence of the importance of financial payments as a system level incentive. In their mixed-methods evaluation with U.S. science teachers receiving instructional innovations, teachers expressed concerns that the financial grant given to participating teachers to buy materials was not sufficient to support the resources that the programme encouraged using across the year. Financial incentives may help initial adoption but if they are insufficient this will not sustain a new approach.

Leadbeater et al.'s (2015) longitudinal qualitative study that explored how well a programme focused on preventing peer victimisation in elementary schools was adopted and then sustained over two years found evidence that when training time was not compensated teachers attitudes and perception can be negatively influenced. In a systematic review of health promotion programmes, Hung et al. (2014) found that a lack of financial support both to compensate overtime work by health promoters in school and to fund ongoing professional development was considered the largest barrier to sustaining such programmes by staff. Austin et al. (2011) sought to identify barriers and facilitators to adopting a school-based physical activity intervention. While interviews revealed that one principal reported that the funding of equipment resources and professional development was key to participating in the research study, they also found that the ease of sustaining the intervention and how well the intervention could fit with the existing school context was an important incentive to adopt the intervention.

Funded resources and professional development is evidenced as incentivising adoption of an intervention although Carson et al. (2020) found that the incentive of a funded professional development workshop is not sufficient to increase adoption of a programme by all staff. In their study, evaluating a professional development programme for school physical activity, they found the delivery of an initial free and highly-regarded workshop facilitated adoption of the programme for some, but not all teachers. Similarly, Weist et al. (2019) evaluated the implementation of high quality school mental health services. They reported how strong professional development and implementation support did not lead to impact on pupil outcomes. They concluded that a lack of accountability and incentives for staff to deliver components of the programme learnt in training and take up opportunities for support had an impact. While staff received small gift cards for taking part in the research study, there was a lack of incentives related to performance or recognising

increased responsibilities in delivering the programme. Arnold et al. (2021) conducted a qualitative study interviewing those involved in delivering a trauma-informed universal mental health intervention using interviews and reviewing fidelity logs. None of the 13 schools sustained using the intervention. One barrier to sustaining the implementation was the reduction in incentives after schools worked with the research team during the first year of the programme. Although free training and consultation was available, the lack of incentives for participating students and stipends for school staff meant that schools were unclear whether they should be sustaining the programme themselves.

In summary, a range of studies including one review, one quantitative study, four mixed-methods studies, and three qualitative studies demonstrate some beneficial impact of using incentives on outcomes that include buy-in, adoption, fidelity, and sustainability. The evidence reviewed suggests mixed benefits though. Incentives may not motivate all individuals in the same way and often incentives are used alongside other key implementation strategies such as professional development, reminders, and champions, which may themselves be driving these outcomes.

What does the evidence tell us about the situations in which schools might use this strategy?

There is mixed evidence that incentives have been used beneficially in research ranging from physical activity, social and emotional programmes, and teaching and learning approaches but incentives also vary, particularly in terms of whether they are financially significant or appeal through recognising work toward implementation. There is also evidence that incentives are not used in isolation, with the incentives often representing a separate implementation strategy, such as professional development or acquiring funding.

However, Guhn (2009) cautions that people are not all motivated by the same incentives. Therefore, approaches to incentives need to be considered carefully to ensure they are meaningful to those incentivised and drive towards the implementation goals.

Dariotis et al. (2017) interviewed both pupils and classroom teachers about their perspectives regarding a 16-week mindfulness and yoga programme running in their elementary schools. They were interested in what would incentivise participants to improve buy-in to the programme. They found little evidence that financial incentives improve implementation outcomes. The teachers in the study reported that the programme improving pupil behaviour and reducing the time teachers spend disciplining students would incentivise other teachers to take part. This reiterates that the particular incentive can vary.

It is notable that evidence about incentives in the literature often refers to funding for professional development and resources, so equally relevant to Strategy 60, 'access new funding'. There is also separate evidence that using local consensus discussions and champions can increase adoption of new interventions without necessarily requiring financial incentives which may be limited. However, some evidence suggests that champions can be incentivised to perform this role. Hollingshead (2009), in their study of a character education programme, found that champions could be incentivised through recognition from school leadership and receiving resources to help support colleagues. Similarly, Thomas et al. (2016) found that champions could be incentivised to take this role by highlighting the additional skills they would gain.

Scaletta and Hughes (2021) report a similar finding in relation to incentives for implementation teams. In their evaluation of leadership practices related to schoolwide positive behavioural interventions and supports, administrators reflected on the need to actively recognise the hard work of the implementation team through rewarding their efforts and school leaders better acknowledging their work.

What does the evidence tell us about how the strategy works well?

There is evidence that incentives can improve buy-in and adoption when they focus on recognising the work in organising and delivering a new approach and when incentives are selected that are meaningful to recipients.

Williams et al. (2021) report status and recognition are two aspects that school leaders can adjust to encourage the adoption of new approaches by staff. In their qualitative study, teachers reported that principals conveyed respect and appreciation for the expertise of special education teachers within the school. They also saw status and recognition of using evidence-based practices elevated through the use of recognition and rewards. Direct financial incentives were not used but praise from the principal was noted as incentivising, and principals recognised teachers' expertise by asking for advice and encouraging them to run professional development for other staff. In addition, Williams et al. (2021) found providing meaningful but cost-neutral titles to staff can act as an incentive. This study did indicate that these incentives maybe less effective in less proficient and more rigid school cultures.

Hung et al.'s (2014) systematic review reported a similar finding, although they found that health promoting staff were motivated by external recognition, such as visitors to the school. The opportunity to receive certification as a health promoting school recognised the school's collective achievement and made this visible.

Moore et al. (2021) report the range of implementation strategies that were used in a trauma-informed prevention programme in 29 schools. Incentives were used as an implementation strategy, including gift cards, refreshments, and small prizes for students and gift cards for school staff. Schools also received free training and support from the research team. However, these incentives were an example of how implementation strategies were tailored over time. From Year

2 of the programme student incentives were modified in response to feedback. Also, both staff and student incentives were tied to session attendance and participation. Alongside a range of other implementation strategies, participants reported impact on fidelity, acceptability, feasibility, and adoption.

Where specific activities are needed for interventions, incentives can be employed to encourage full participation. For example, Hollingshead (2009) reported that a secondary school leader made personal requests to individual staff to encourage them to participate in a relationship-building lunch event with students. Hollingshead (2009) also reported that planned celebrations can help to improve and sustain buy-in toward the character education programme being implemented by recognising the effort and achievements of those involved in the approach. A celebration called Rachel's Rally was organised by those leading the programme that both demonstrated kindness and compassion as part of the programme and helped to increase collective buy-in and adoption. Lastly, in one school, staff were allowed to wear jeans at a lunch event with students. This was reported to support staff engaged in the programme as well as encouraging other staff to get involved in the programme. This indicates that small, cost-neutral incentives may be useful to enhance adoption of new approaches.

Thomas et al. (2016) reported slightly different use of incentives in their process evaluation of interventions to encourage consumption of fruit, vegetables, and milk in middle school cafeterias. Both intervention staff and school providers mentioned the use of small incentives to generate interest in the project. They used ideas like celebrations and movie tickets for schools with the best outcomes to develop friendly competition.

Walker et al. (2022) conducted a qualitative study with elementary school staff to identify implementation strategies that support the delivery of classroom-based physical activity approaches. This study reported that school leaders and colleagues used a range of positive reinforcement to support implementation. However, this tended to be encouragement from school leaders and setting expectations about using the approaches in lessons. Reinforcement was also seen using reminders. These schools decided against mandating the use of approaches, choosing to encourage positive support from teachers and establishing a core group of teachers using the programme to increase visibility and raise interest amongst students and staff.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory context of *enabling structures* is relevant to alter and provide incentives because providing resources that help support implementation is a key enabling structure. The availability of support and training focused on implementation has been recognised as an enabling structure (Distel et al., 2019). The evidence shows the importance of putting in place any incentive systems with care so that they are enabling, preferably for the range of stakeholders taking on a greater workload, and targeting buy-in for subgroups of individuals (Hollingshead, 2009). However, often the resources that might be put in place to aid adoption are focused on the intervention and therefore *intervention features* are a relevant context here. The quality and availability of intervention resources and professional development are evidenced to be incentives to intervention adoption (Evans et al., 2015). However, a range of research suggests that funding professional development in the short-term or in isolation is unlikely to help sustain an intervention over time (Hung et al., 2014). Therefore, considering the mechanisms from the programme theory can help to explain some of the mixed evidence that is seen in relation to incentives. Incentives need to be *engaging* in order that they are motivating. However, the evidence suggests that incentives alone cannot be relied on to increase buy-in and therefore when incentives drive outcomes they need to do more than raise interest and motivation in relation to the new approach. While financial incentives can help to *unite* views and values around the importance of adopting an intervention (Kaimal and Jordan, 2016), a range of evidence shows the different ways that incentives are used to improve buy-in towards an intervention and therefore help to *unite* views and values about an intervention. This includes praise, status, recognition, small performance-related awards, and belief that the intervention will improve pupil outcomes. There was also a little evidence that suggested the importance of *engaging* stakeholders about what incentives would be meaningful (Moore et al., 2020).

Our realist synthesis indicated the interaction of enabling structures and uniting impacting adoption and buy-in as indicated in the ICAMO configuration below.

ICAMO configuration for alter and provide incentives

When considering whether and how to supplement other implementation strategies with incentives, schools will wish to consider the programme theory context of enabling structures. Our analysis suggests that acquiring resources and funding for professional development can act as an incentive to increase buy-in and adoption. Data monitoring systems are important too as an incentive may not be financial, rather it can be meaningful to individuals or simply show how the new approach will address the identified need for the school. Leadership and implementation team members will be able to access any incentives, carefully consider their value and sustainability, identify whether incentives are meaningful beyond acquiring funding, and other strategies that increase adoption (e.g. champions). Incentives that are carefully considered in this way can help unite views and values about a new approach. Resources and professional development made accessible to staff can itself unite understanding and practices around a new approach. While active recognition of staff involvement in a new approach can help to maintain buy-in. This leads implementing staff to greater intervention

adoption and buy-in. Furthermore, by critically considering the use and impact of incentives over the longer-term actors can help to shape whether incentives stop at initial buy-in or whether this is sustained.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 61: Alter and provide individual- and system-level incentives				
Work to provide individual (e.g., recognition and acknowledge, gift card) and/or system-level incentives to districts or schools to participate (e.g., grant money, free training, and consultative support) and engage in an implementation effort involving a new practice.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures – Systems and processes are put in place that proactively or reactively provide recognition to individuals who are involved in implementing new approaches. Resources and funding are sought to ease access to the new approach.	School leaders and implementation team members identify incentives.	Uniting via meaningful incentives that raise awareness and understanding about a new approach.	Adoption and buy-in.	Hollingshead, 2009; Williams et al., 2021; Jago et al., 2015; Karagiorgi, 2005; Kaimal and Jordan, 2009; Dariotis et al., 2017; Dass, 2001; Blaine et al., 2017; Thomas et al., 2016; Weist et al., 2019; Bishop et al., 2015; Austin et al., 2011; Cook et al., 2019; Kennedy et al 2019; Hung et al., 2014; Dyssegaard, 2017; Fenton, 2002; Evans et al., 2015; Guhn, 2009.
CERQual confidence rating: Low				

Summary

There is mixed evidence that financial incentives either distributed to staff leading or delivering a new approach or in the form of funded professional development and resources impacts on adoption and buy-in implementation outcomes. Funding may not be available over the long term and other incentives such as recognition and the perceived benefit of the new approach to address a problem for the school can influence buy-in towards the new approach. There is little evidence to suggest that incentives can work as an implementation strategy in isolation as other strategies are likely to encourage meaningful buy-in, such as local consensus discussions, planning, engaging pupils and parents, supervision, and problem-solving. Our realist synthesis shows how enabling structures are needed both to inform meaningful incentives that can be used and access them. Incentives are less likely to be seen as a reward for work completed but more likely to incentivise behaviour and change views about a new approach if they are used to unite views and values about the benefits of a new approach—particularly as this strategy, when used carefully, has potential to increase buy-in towards, and adoption of, the intervention. The ICAMO configuration is rated as a low level of confidence. Although a meta-analysis supported the impact of rewards, the impact of incentives tends to be mixed, pointing to the importance of what is driving an incentive. There are methodological limitations because the cited evidence often conflates incentives with other strategies, such as professional development, resources, and acquiring funding. This limits the coherence and adequacy of this finding in relation to the strategy alone.

8. Obtain and use student and family feedback

SISTER Strategy 8 recommends those implementing in schools to consider *obtaining and using feedback* from students and families to gather feedback to shape the use of other implementation strategies and measure buy-in. Feedback can be used to assess whether the intervention aligns with the beliefs students and families hold about it. The process of obtaining and using the feedback will range from informal answers or unsolicited comment from a student or family member to planned surveys and meetings with all parents and students or representative groups. We see this strategy as relevant across implementation phases as feedback can be sought on priorities, intervention options, or upon an intervention that has been put in place; literature tends to assume the feedback will be about an intervention that has been introduced in practice and therefore this strategy would be seen later than others.

To what extent does the evidence indicate outcomes?

We found a lack of evidence that this strategy directly impacts outcomes. We located more research that suggests when and how schools might gather and respond to student and family feedback. There is a sense from other research that in isolation only collecting and using feedback on an intervention that has already been introduced is less impactful and misses an opportunity for more active engagement with pupils and families throughout phases of implementation, as indicated in Strategy 57, which focused on involving these stakeholders. Still, when Lyon et al. (2019) surveyed 200 school-based consultants who support social, emotional, and mental health services, participants considered obtaining and using student and family feedback as both an important and feasible SISTER strategy.

What does the evidence tell us about the situations in which schools might use this strategy?

Morse and Allensworth (2015) discuss how students can be engaged with the Whole School, Whole Community, Whole Child Framework. The paper warns of only seeing students as sources of student voice data and places students expressing their views and consultation at one end of a spectrum of students as stakeholders and collaborators. Students might participate in decision-making based on their data and with further engagement might—as shown in evidence for Strategy 57—become involved as partners or leaders of change. This paper suggests that even though pupil involvement may occur earlier and impact buy-in to an intervention, pupil involvement and feedback should go hand in hand.

Feedback from pupils and families who may be directly and indirectly involved in an intervention is necessary to consider adaptations and sustain the delivery of an intervention with fidelity. It also helps to show evidence of their perceptions of intervention outcomes, which may help to maintain buy-in through evidencing early beneficial outcomes (Guhn 2009; Fagan et al., 2009).

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. School staff chose to use this strategy independently, although this was to collect feedback from pupils rather than families.

Obtaining feedback from families may be met with resistance based on their view of prior consultation or negative school experiences. Guhn (2009) reports in a systematic review of factors that help sustain school reform projects that support and convenient timing of meetings can be important for families to attend and provide feedback. Mouw et al. (2016) evaluated views about an HIV prevention intervention and noted that the format of family and pupil feedback needs to be considered given views about the priority area. Anonymous feedback and safe spaces for meetings may need to be considered when an intervention may hold sensitive or contrasting views.

What does the evidence tell us about how the strategy works well?

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma informed prevention programme for 13- to 14-year-old students in the U.S.A. Gaining feedback from students through focus groups and surveys was one of 37 implementation strategies used with a focus on pupil views on the intervention.

The process of seeking and acting upon feedback, whether informal or formal, can build mutually supportive partnerships (Guhn 2009; Valois et al., 2015) and encourages common interest in an intervention across stakeholders, indicating that school leaders are willing to share decision-making authentically and meaningfully (Alonge et al., 2020). Partnerships are more likely to be built and sustained if feedback is ongoing and allows open responses, rather than closed satisfaction ratings only (Valois et al., 2015). While it is important to collect data from pupils and parents about their views on an intervention in practice, seeking more open feedback can lead to unearthing mistaken assumptions and differences in priorities, philosophies, and values and so provide the opportunity to address tensions across stakeholder groups and help align buy-in towards an intervention (Mouw et al., 2016), which has been shown as important across different groups including pupils and parents because their beliefs will influence each other's (Sadjadi et al., 2021).

Ott et al. (2020) evaluate the engagement by a range of stakeholders in resilience-based adolescent pregnancy prevention interventions. These interventions were community-based but involved schools. The study found that local champions were the most important element of successful implementation in terms of use and attitudes towards the intervention. These local champions included both student and parent representation, often through advisory boards. This suggests both a link to pupil and family involvement strategies as these advisory boards were often an ongoing source of data and feedback. Advisory boards allowed for pupils and parents to act as informal spokespeople, allowing informal feedback that represents a range of peers.

Mendenhall et al. (2013) conducted case study research with six U.S. schools that had introduced a whole-school approach focused on the mental health needs of pupils and families. Perceptions of barriers and facilitators were collected from a range of different stakeholders and compared across these groups. While lack of buy-in was a key barrier to adoption across groups, parents focused on issues that were specific to them and their experiences with the

schools. This suggests the importance of earlier feedback about buy-in and readiness for an intervention rather than only a focus on feedback once an intervention is introduced. It also suggests that pupil and parent feedback ought not only focus on the intervention but also on what stakeholders think will help and hinder the intervention being adopted and sustained and what may need to change for this to happen. As such, this strategy seeking feedback from pupils and families ought to be part of SISTER Strategy 1, ‘assess for readiness and identify barriers and facilitators’. In the Mendenhall et al. (2013) example, obtaining and using the feedback earlier could have enhanced parent buy-in to the intervention, identified parent training needs, and would have shown parents that the school responds to these views.

The feedback gained, actions that follow, and where the responsibilities lie should then be documented and made transparent to all stakeholders. In this way, students and families unite around the intervention implementation to achieve the target intervention outcomes.

What does our realist review show are relevant contexts and mechanisms?

The mechanism of *engaging* underpins efforts to involve and engage students and families across implementation whether this feedback is sought earlier in relation to informing decisions about the new approach to be adopted or here later to use their feedback about a new approach as part of monitoring impact. Engagement needs to be meaningful, and this shows the value of any feedback sought from these stakeholders impacted by implementation both engaging their voice and their interest. The programme theory context of an *enabling structure* that supports the authentic and meaningful use of data from those indirectly related to the school intervention implementation applies. In this case students and parents. The level of formality of this *enabling structure* needs to be flexible to capture their feedback in different ways. The authenticity and meaningfulness of their participation derives from their perspectives being used constructively by those implementing the intervention. For this strategy, and within this structure, students and parents can be *agents for change* when they are empowered in the implementation effort. Through the communication of their perspectives during formal or informal interactions they can signpost, advocate, monitor, provide feedback up and down the system, and support problem-solving. They can also help to drive the change. The *reflection* by leadership and implementation team members on the contributions from students and parents, whether via informal or formal group or individual meetings, means that their voices are *engaged* and they are able to respond effectively in ways that *unite* knowledge and understanding. Applying different methods of *reflection* on these voices and values has the potential to challenge, reorient, or strengthen implementation processes. *Intervention features* are important as the relevance of the intervention to pupils and families may affect how feedback is sought.

Our realist synthesis indicated the interaction of enabling structures to engage voices impacting acceptability and buy-in amongst other outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for obtain and use student and family feedback

When gathering student and family feedback an enabling structure for this data collection is necessary. The literature suggests that gathering feedback is an important part of the implementation process. School leaders and implementation teams will need to consider when and how they will gather student and parent feedback. The process of obtaining and using the feedback will range from informal questions or unsolicited comments from a student or family member to a planned meeting or meetings with an invited group of family or student representatives, or an open invitation to all. This feedback is more likely to drive outcomes when students and families feel as though they are engaged in this process and their feedback will be acted upon. The knowledge derived from the feedback can be used to help to see and plan for barriers and facilitators throughout the implementation thereby supporting the readiness and acceptability of the implementation process. Also, through this engagement, gathering and acting upon feedback helps students and parents to feel the intervention is meaningful to them and so their buy-in to the process is enhanced. If this engagement is ongoing then the sustainability of the implementation can be improved.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 8: Obtain and use student and family feedback				
Develop strategies to increase student and family feedback on the implementation effort.				
Context	Actor	Mechanism	Outcome	Evidence

Enabling structure that facilitates the gathering of student and family feedback and opportunities to act upon this.	Leadership, implementation teams, pupils, and families providing feedback.	Engaging voices of students and families in a meaningful way and over time.	Facilitates knowledge-sharing, empowers students and parents to support the implementation efforts, and enhances their ownership of the process on an ongoing basis. Readiness Acceptability Buy-in Sustainability	Alonge et al., 2020; Leeman et al., 2018; Sun et al., 2007; Guhn et al., 2009; Sadjadi et al., 2021; Mendenhall et al., 2013; Mouw, 2016; Ott et al., 2020; Temple University College of Education, 2010; Valois, 2015; Fagan, 2009.
CERQual confidence rating: Low				

Summary

A relatively small amount of evidence shows the impact of obtaining and using pupil and family feedback although there are a range of examples from research of it happening and its importance being argued. Evidence tends to suggest that pupil and family feedback is more impactful when there is involvement of the kind considered in Strategy 57. The adequacy of the evidence informing this review finding is therefore a concern and the ICAMO has a low confidence rating.

12. Facilitation/problem-solving

SISTER Strategy 12, 'facilitation/problem-solving' (Cook et al., 2019), is defined as 'a process of interactive problem-solving and support that occurs in a context of a recognized need for improvement in the implementation of a specific practice and a nonevaluative but informative and supportive interpersonal relationship' (p. 921). It is categorised as a strategy which falls under 'provide interactive assistance'.

Definitions in the literature

'Facilitation/problem-solving' captures a broad array of more granular level strategies. These include strategies relating to data capture, data analysis, and dissemination amongst the implementation team (Schildkamp et al., 2019) as well as strategies which tackle financial and other logistical elements that may pose challenges (Albers et al., 2021). Facilitation and problem-solving also refers to the ways in which implementers communicate and relate with each other, pupils, the wider community, and with the intervention itself (March et al., 2016). The term 'facilitation' refers to the process of making something possible or easier and the act of helping other people to deal with a process or reach an agreement or solution without getting directly involved in the process or discussion. The emphasis on the facilitator as enabler is a condition which seeks to generate greater degrees of agency and autonomy amongst implementers.

To what extent does the evidence indicate outcomes?

Several studies ranging in design indicate the benefit of facilitation and problem-solving, particularly for fidelity. This indicates that support is often needed when there is difficulty in delivering a new approach. Facilitation and problem-solving in the form of coaching may impact implementation outcomes but it is more likely to help identify other strategies that are then used to improve delivery and address any identified concerns.

Merle et al. (2022) conducted a meta-analysis of single-case literature that sought to examine the effects of implementation strategies to improve teacher adherence to evidence-based practices to address pupil social, emotional, and behavioural needs. They found a large beneficial effect on fidelity from eight studies that reported problem-solving barriers to implementation as a strategy used. While the effect size was large ($g=1.99$) this was one of the smallest effect sizes reported across the range of strategies considered in the meta-analysis.

Using evaluative data captured from 31 U.S. schools that had implemented a response to intervention model, March et al. (2016) examined the links between professional development and coaching and facilitating problem-solving implementation with fidelity. Through examining data on quality of coaching received, continuity of coaching (i.e., coaching provided by the same individual over time), changes in educator beliefs and perceived skills, and problem-solving via multilevel modelling, March et al. were able to show that coaching continuity positively related to

implementation fidelity. This may evidence the benefit of a supportive interpersonal relationship as mentioned in the strategy description.

A longitudinal exploratory multiple case study investigated formal leadership behaviours in data teams (Schildkamp et al., 2019). According to the study, effective data teams seek to solve problems based on a core understanding of what data can tell them about progress, fidelity, effectiveness, and penetration. Effective data teams are linked to implementation outcomes such as sustainability. Schildkamp et al. indicate that one of the building blocks for school leaders wanting to build effective data teams in their school is providing individualised support to colleagues.

A relevant study evaluated the fidelity of problem-solving interventions used by multidisciplinary teams in 227 schools and the relationship to student outcomes (Telzrow et al., 2000). Although the problem-solving was part of assessments used to identify intervention responses for students with behavioural and learning needs, they hold high relevance to the actions described as part of this implementation strategy. Researchers found that presence of two problem-solving components, having a clearly identified goal related to the nature of the problem, and collecting and using student-level data to inform decision-making, were significant predictors of student outcomes, defined by the study as the degree to which the student's target was met. Highest fidelity scores were evident after defining the problem and having a clearly identified goal.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. The paper reports that facilitation/problem-solving was a strategy that implementation teams amplified as being of importance; there was evidence of implementation teams problem-solving together as well as with coaches, administrators, researchers, and school community members. Because of the type of intervention, sometimes problems were unexpected and related to staff discomfort in the intervention topic. Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. They also evidenced the use of this strategy, although it tended to be led by researchers.

In summary, a handful of studies including one review, one quantitative study, one mixed-methods study, and three qualitative studies demonstrate beneficial impact of facilitation and problem-solving on outcomes that include fidelity and sustainability. The evidence reviewed suggests beneficial outcomes when this support and problem-solving leads to further implementation action.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that strategies which promote facilitation and problem-solving are used in several capacities during the implementation of evidence-based practice.

When managing resources, for example, implementation leads may act in response to changes to funding or resources in inventive ways to minimise disruption. Collaboration between regional schools to pool resources or to problem solve together was found to be a useful strategy for managing challenges (Durand et al., 2016).

When exploring implementer attitude and behaviour toward implementation, for example, implementation leads may capture data through formal and informal methods to establish whether behaviours related to implementation are positive, negative, or neutral and to identify the underlying drivers of behaviours. Evidence suggests that the three diagnostic dimensions of the Concerns Based Adoption Model (CBAM)—stages of concern, levels of use, and innovation configurations—can be helpful tools when exploring implementation drivers and behaviours (Hall, 2013). Roach et al. (2009) explain that innovation configurations help to identify differences in the ways in which implementation is being approached across teams, which can be a useful guide to monitor implementation outcomes such as fidelity and penetration.

Whilst Hollingshead (2009) suggests that during implementation phases after initial delivery school and implementation leaders should be ready to monitor and adjust the original plans for facilitating implementation in response to early outcomes it is also noted that the interactive and often unpredictable dynamics at play in the school context requires a willingness and capability to engage with complex problem-solving.

What does the evidence tell us about how the strategy works well?

Shared decision-making and leadership capabilities to draw on evidence to inform problem-solving while building trust with wider implementers are all linked to facilitation and problem-solving. Trapani et al. (2018) suggest that facilitating change at a school level is a team effort, and that it is key to place emphasis on shared decision-making when enacting change for personal and collective agency to be developed. Robinson and Gray (2017) propose that leadership capacity and capability is key to driving effective changes at the school level through facilitation and problem-solving strategies. Leaders who can 'use their research and professional knowledge to solve complex problems of teaching and learning while building trust with those involved' (p. 2) are thought to be more effective facilitators of school-level change than leaders who are unequipped to draw from a range of these skillsets.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

The concept of de-centralisation plays a role in hindering or enhancing the potential impacts of facilitation and problem-solving. In the context of interpreting schools as complex adaptive systems, de-centralisation refers to shared and distributed control amongst actors in the system (Keshavarz et al., 2010). Koh and Askill-Williams (2021) suggest that schools which exhibit decentralised characteristics tend not to give preference to social or organisational power hierarchies, or the direction from which change comes, preferring to integrate bottom-up, top-down, and lateral involvement of all stakeholders in schools. This sharing of power and decision-making in implementation forms a fruitful basis for facilitation and problem-solving, which is thought to improve the sustainability of school improvement efforts.

What does our realist review show are relevant contexts and mechanisms?

Our programme theory constructs speak to the strategy of facilitation and problem-solving in several ways. *Enabling structures* can provide the logistical supports for facilitation to take place, including dedicated time and space for exploration, test-driving ideas, and evaluating practice using the latest data (Albers et al., 2021; Merle et al., 2022; Ryan Jackson et al., 2018).

Evidence suggests that it is closely tied to the mechanism of *reflecting* and is linked to the *features of the intervention* which is being implemented (Hall, 2013). Our analysis also provides insights into the nature of building and sustaining non-evaluative but informative and supportive interpersonal relationships in implementation which are conducive to effective problem-solving in teams (Hollingshead, 2009; Robinson and Gray, 2017). This can be achieved when *agents for change*, particularly implementation leaders, facilitate enquiry into problem-solving that is non-evaluative and founded on supportive relationships with the range of actors who may identify issues with implementation (Gabby et al., 2017; Burgess et al., 2010; Azukas, 2019). This occurs when there is a balance between speaking and listening amongst all team members and where there is an acknowledgement of differing perspectives (Garvis et al., 2013). This can help leaders to *engage* sensitively and effectively with ideas around how to solve problems which have arisen in implementation to *unite* practice around the shared goals of implementation (Albers et al., 2021; Hopkins et al., 2014; Ryan Jackson et al., 2018;). While problem-solving implies reflection, our evidence suggests that when agents for change are supporting implementers to problem-solve this is often uniting implementation practice and re-affirming the value of the intervention as addressing a shared priority.

ICAMO configuration for facilitation/problem-solving

Closely tied to relationships and reciprocity, facilitation and problem-solving can be nurtured by an implementation leader who is an agent for change facilitating the collection of views about barriers to implementation and who is supportive and empowers others to problem solve. Uniting values, understanding, and objectives with tangible actions can help to establish and maintain effective facilitation and problem-solving strategies. It can be helpful for implementation teams to explore perceptions of problem-solving and the nature of this process within the context of the school environment. Clarity and consensus around how to respond to issues, challenges, and concerns can lead to increased motivation, greater implementer wellbeing, and sustainability. Addressing barriers can lead to improved fidelity and pupil outcomes.

Implementation strategy 12: Facilitation and problem-solving				
Interactive problem-solving and support that occurs in a context of a recognised need for improvement in the implementation of a specific practice and a non-evaluative but informative and supportive interpersonal relationship				
Context	Actor	Mechanism	Outcome	Evidence
Agents for change: Facilitating problem-solving in a range of actors, empowering them to do so.	School leaders/ implementation leaders.	Uniting: values, understanding, and objectives with actions can help to establish and maintain effective problem-solving strategies.	Motivation Wellbeing Sustainability Fidelity Pupil outcomes	Hollingshead, 2009; Burgess et al., 2010; Garvis et al., 2013; Hall, 2013; Hopkins et al., 2014; Robinson and Gray, 2017; Gabby et al., 2017; Ryan Jackson et al., 2018; Azukas, 2019; Albers et al., 2021; Merle et al., 2022.

Summary

There is evidence that facilitation and problem-solving and related activities are beneficial and linked to fidelity and pupil outcomes. There is only a small amount of evidence that focuses on the impact of this strategy. More evidence demonstrates the importance of problem-solving as a collective activity and strong interpersonal relationships between implementation leaders and implementers. Our realist analysis shows how agents for change can unite implementation actors around values, understanding, and objectives and how these processes can help to identify which actions will help overcome implementation problems.

Because the problem-solving is likely to be wide ranging and the barriers need to be addressed to improve outcomes, the strategy is recognised as important, but the evidence is not coherent in terms of showing how solved problems lead to outcomes that could be replicated. The ICAMO configuration is therefore rated at a low confidence level.

50. Facilitate a relay of intervention fidelity and student data to school personnel

SISTER Strategy 50, 'facilitate a relay of intervention fidelity and student data to school personnel', recommends 'providing as close to real-time data as possible about key measures of intervention fidelity and student outcomes using integrated modes/channels of communication (e.g., email, social media, face-to-face notes) in a way that promotes use of the targeted new practices' (Cook et al., 2019, p.926). It falls under strategies aimed at supporting practitioners.

Definitions in the literature

It is notable that this strategy is not categorised as an evaluative and iterative strategy; rather, the focus is upon the use of data previously collected. The relay of data is both an event and a process as the mere relaying of data, whilst necessary, does not imply outcomes; it is the ways in which the data is processed and understood by school personnel, as well as how this understanding feeds into decision-making, that generates implementation and pupil and outcomes.

To what extent does the evidence indicate outcomes?

Facilitating a relay of intervention fidelity and student data to school personnel is associated with improving adoption, fidelity, pupil outcomes, and penetration. Evidence suggests this from a range of study designs including reviews, although the focus tends to be on sharing and encouraging the use of fidelity data, so implementers can improve their delivery, rather than about broader reflection on why pupil outcomes have been seen.

Lohrmann et al. (2008) conducted a qualitative study with practitioners who provide schools assistance when implementing school-wide positive behaviour support seeking to identify and understand barriers to school staff adoption of the intervention. One of the barriers focused on staff not anticipating positive change from the intervention or intervention fatigue. A strategy used by participants was to show staff data, often through pilots of small scale efforts in the school, of the intervention having an impact in their school. Findings suggest that seeing this data can help staff buy-in and hence adoption. This suggests the importance of sharing early data with staff, particularly if there is some resistance to a new intervention.

Other reviews have identified the relaying of intervention fidelity and student data to school personnel as beneficial from amongst a range of implementation strategies. In a systematic evidence review of school-based physical activity interventions, Kennedy et al. (2021) noted that the collection, sharing, and disseminating of implementation fidelity measures was central to understanding pupil outcomes and in interpreting the degrees to which penetration has occurred. The review found that in studies where school personnel utilised lesson observations to evaluate implementation fidelity, schools experienced higher degrees of implementation, particularly when this information was disseminated to teachers to understand and reflect on practice. However, the researchers noted a general lack of implementation reporting in many studies, which made understanding the links between observing and measuring fidelity and outcomes difficult to understand: this was reflected in a similar review by Cassar et al. (2019) who reported that of 27 included studies, only a little over half reported on how implementation was measured and how this data was relayed in ways which aimed to improve practice.

In summary, a small number of studies that included two reviews and one qualitative study demonstrate beneficial impact of providing fidelity data to implementers on outcomes that include adoption, fidelity, pupil outcomes, and penetration. The evidence reviewed suggests beneficial outcomes when the focus tends to be on sharing and encouraging the use of fidelity data so implementers can improve their delivery rather than about using pupil outcome data in the same way.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence indicates that facilitating a relay of intervention fidelity and student data to school personnel can enable informed decision-making across phases of implementation (Moullin et al., 2019) and in tandem with a range of interventions.

The extent of the relay of data, including who this includes, is dependent on the nature of the intervention being implemented as well as the types and range of stakeholders involved. For instance, some interventions are developed and implemented in collaborative partnership between schools and researchers. In a three-year, mixed method case study—which explored the adoption, implementation, and evaluation of the Ohio Community Collaboration Model for School Improvement in one urban U.S. school district—Anderson-Butcher found that the more opportunity for stakeholder groups to connect (in this case school-based staff and university-based programme developers), the more joint decisions were made in ‘relationship to the evaluation design, research procedures, and constructs assessed’ (Anderson-Butcher, 2016, p.201). These joint decisions were associated with improving implementation penetration and the academic motivation of pupils. However, researchers also noted that even greater amounts of time and attention could have been given to the relay of data and its associated ongoing dialogue, which would have improved outcomes further.

What does the evidence tell us about how the strategy works well?

Evidence suggests that by relaying data to school personnel, a greater understanding of implementation and its effects on pupil outcomes can be generated. As touched on earlier in this section, relaying data is the mechanism in which discussion, analysis, and dissemination can take place among implementers (Robinson and Gray, 2019; Trapani and Annunziato, 2018). This can subsequently feed into decision-making and decisions become both evidence informed, and responsive to the needs of pupils and the school context (Michael et al., 2019; Herlitz et al., 2020; Hudson et al., 2020).

Van Geel et al. (2017) evaluated how school characteristics were related to the combined assessment of fidelity, reach, and teaching performance after using a data-based decision-making intervention and sustaining the intervention after two years in the Dutch primary school context. Relaying of data is fundamental to this type of intervention. While data-based decisions could be made by school leaders, the authors recognise that collective participation of all school staff enhances the implementation of this approach. Continuity of the school leader, academic coaches, and teachers appears to relate strongly to implementation of the data-based decision-making. Support from school leaders and a coach also predicted higher implementation. Furthermore, schools with leaders who did not provide teachers with time or resources to use the data had lower implementation scores. Whilst this small-scale study requires further studies to confirm its causal claims, it does suggest that leaders and trainers should pay attention to developing clear guidelines and agreements on how and when to share fidelity data for collective decision-making as this would improve the likelihood of generating sustained improvements to data handling and management across the school context.

A small scale (n=4 schools) qualitative evaluation study which examined the implementation process of outcomes of a TaMHS (Targeting Mental Health in Schools) project found that effective communication mechanisms such as an ‘advice helpline, weekly meetings, lunchtime supervision and consistent use of language’ helped to increase implementer wellbeing, perceived pupil engagement and mental health related outcomes, as well as fidelity amongst participating schools (Cane and Oland, 2015). Similarly, staff recognised the importance of cascading communication, support, and training but admitted that this is challenging, particularly without leadership vision and support. This highlights a need for schools to develop effective, formal feedback mechanisms to disseminate support, training, and fidelity data. This suggests that schools need to develop practice which moves beyond facilitating a relay of intervention fidelity and student data to school personnel (Cook, 2019, p.926) to consider the ways in which these processes will facilitate meaningful dissemination and knowledge building which can inform intelligent adaptations to implementation process and practice.

The perceived degree of fidelity to which an intervention is being delivered may also help to create the conditions for the relaying of data to take place and be effective. A study which drew data from year two of a three-year randomised field trial of a programme in 45 schools, which looked at the effect of implementation climate on programme fidelity and student outcomes in autism support classrooms, found that in classrooms with a strong perceived implementation climate, higher fidelity was associated with better student outcomes (Kratz et al., 2019). However, the researchers note that whilst important, positive perceptions of climate and fidelity are not sufficient for optimising pupil outcomes, with more research required to understand better how elements of climate and fidelity translate to measurable pupil outcomes.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Evidence suggests that data is the information on which decisions can be usefully based; it is this information that helps to drive learning, build connections, and inform practice. The structures in which data usage and practice take place can take many forms and serve many purposes in the processes of bringing about change. Data collection structures which are inclusive, accessible, and intentional enable a broad and creative approach to data handling to be developed and

maintained (Gagnier and Fisher, 2020; Schildkamp et al., 2019). Data collection structures are often influenced by the ways in which agents navigate established structures, and the demands of a new intervention. Where new interventions are changed to fit existing systems, rather than data used to inform changes to existing systems, this can lead to problems when established constraints, biases, or patterned behaviours act to inadvertently stall or place limitations on innovation (Metz et al., 2015).

What does our realist review show are relevant contexts and mechanisms?

Our programme theory contexts and mechanisms are all relevant to the processes and strategies involved in relaying intervention fidelity and student data to school personnel. Our analysis suggests that an imbalance or bias toward any one type of data can be problematic in school-based implementation. This can be traced back to the perceptions, practices, and priorities of *agents for change*, such as leaders or staff implementing an approach at a classroom level (Hudson et al., 2020; Trapani and Annunziato, 2018). To mediate different perspectives and tackle what is sometimes described as 'questionnaire fatigue' (Anderson-Butcher, 2016) implementation processes must capture differing data on implementation, through *engaging* a range of perspectives including pupils where possible (Gale et al., 2020; Scaletta and Tejero Hughes, 2021). This can also ensure that implementation teams remain receptive to the often-unanticipated outcomes of implementation which can indicate important facilitators and barriers.

However, creating and maintaining *enabling structures* are key to generating a relay of data that is both efficient and effective (van Geel et al., 2017). These structures need to be flexible and responsive to practice (Anderson-Butcher et al., 2016; Trapani and Annunziato, 2018; Robinson and Gray, 2019). Data collection needs to provide snapshots of implementation at various timepoints to help monitor implementation patterns or tendencies (Gale et al., 2020). Moreover, structures which capture data at various timepoints of implementation are helpful in building an understanding of how those involved in implementation engage over time and what broader influencing factors are interacting with practice (Scaletta and Tejero Hughes, 2021). This helps to develop a more holistic oversight of the ways in which implementation strategies are functioning and the outcomes which they are generating.

Reflecting on fidelity and pupil outcomes is also useful in establishing an understanding of the role implementers are playing in outcomes and what might need to be reviewed (Gale et al., 2020; Trapani and Annunziato, 2018).

ICAMO configuration for facilitate relay of intervention fidelity and student data to school personnel

Enabling structures facilitate a diversity of data practices which can help provide a window into the forms of reasoning which underpin the deeper thinking processes that drive behaviours, practice, and pupil outcomes. Key data needs to be shared with those implementing an intervention so they have feedback to act upon. Implementation leaders' oversight on data collection can provide guidance on how structural design can help to facilitate a relay of intervention fidelity and student data to school personnel, although engaging the community in this process is vital to improve understanding and feasibility. Regularly reflecting on data facilitates greater criticality around which actions are generating greater fidelity and which are linked to pupil outcomes. Sparking candid discussions around data can support school personnel to establish which elements of implementation are strengthening practice and how, helping them to build on this to overcome challenges and improve weaker elements of practice. These insights can, in turn, help to bring about greater implementation outcomes including fidelity, intelligent adaptation, sustainability, and penetration of an approach over time.

Implementation Strategy 50: Relay intervention fidelity and student data to school personnel

Provide as close to real-time data as possible about key measures of intervention fidelity and student outcomes using integrated modes/channels of communication (e.g., email, social media, face-to-face notes) in a way that promotes use of the targeted new practices.

Context	Actor	Mechanism	Outcome	Evidence

Enabling Structures (data collection tools that provide a range of information in a consistent way and allowing time and space for data dissemination).	School leaders/ implementation leaders.	Reflecting (on data regularly facilitates greater criticality around which actions are generating which outcomes and how this can inform decision-making).	Helps implementation teams to link and build a greater depth of understanding around what works and why. Fidelity Sustainability Pupil outcomes	Sun et al., 2007; Anderson-Butcher et al., 2016; van Geel et al., 2017; Robinson and Gray, 2019; Trapani and Annunziato, 2018; 2019; Michael et al., 2019; Herlitz et al., 2020; Hudson et al., 2020; Gale et al., 2020; Scaletta and Tejero Hughes, 2021.
CERQual confidence rating: Low				

Summary

Evidence supports relaying intervention fidelity and student data to school personnel who are implementing an intervention and suggests that this may be linked to a range of outcomes including buy-in, fidelity, sustainability, and pupil outcomes. Facilitating a relay of data is therefore a beneficial strategy in isolation or in line with other related action. However, evidence seems to suggest either the importance of sharing fidelity data with staff so they can reflect on this and make any necessary improvements, or quite broad suggestions that a range of data is necessary to make sense of the reasons for any fidelity and pupil outcomes that are reported. As such, the evidence is rarely specific about how this data is relayed to school staff and there was no evidence about this happening through specific modes of communication as indicated in the strategy.

Our realist synthesis shows how enabling structures facilitate a diversity of data practices that, when coupled with reflective inquiries, can help provide a window into the forms of reasoning which underpin the processes that drive behaviours, practice, and pupil outcomes. These insights can, in turn, help to bring about greater implementation outcomes including intelligent adaptation and sustainability of an approach over time. The ICAMO configuration for relaying data is rated at a low level of confidence due to the adequacy of included evidence holding concerns and that getting data to recipients still relies on other strategies around collecting the right data.

32. Organise school personnel implementation team meetings

SISTER Strategy 32, 'organise school personnel implementation team meetings', is categorised by Cook et al. (2019) as a strategy to develop stakeholder interrelationships. It involves developing and supporting teams of school staff who are delivering a new intervention to have protected time to reflect, share lessons learned, and support one another's learning. This type of implementation meeting will be most relevant once the intervention is in practice and continue to be so as it is sustained. We have not analysed Strategy 13, 'peer-assisted learning', separately as we assume that pairs of implementers observing each other would be similar to this broader strategy. Likewise, Strategy 40, 'create a professional learning collaborative', is similar.

Definitions in the literature

Where implementation team meetings are described in the literature, this is more often in reference to meetings of a practice team as indicated in Strategy 48, so meetings will also be organised for the core implementation team formed earlier and more likely to be inter-disciplinary and decision-making meetings rather than an exclusive need for meetings between individuals who are implementing the practice more widely (Leung et al., 2020). The evidence therefore complements and extends the recommended strategy as it indicates the distinction and utility of both core team meetings and practitioner meetings. Core team meetings can draw upon a foundation of key skills to progress implementation (as described in Strategy 48 above) whilst practitioner meetings can be used to reflect upon and share the specialist skills necessary to implement practices, and to build a sense of inclusion and collective effort (Markette, 2013).

To what extent does the evidence indicate outcomes?

There is evidence that arranging regular practitioner team meetings can improve intervention outcomes relating to adoption, fidelity, and sustainability. Perhaps, importantly, the strategy as described can help to maintain buy-in, which might in turn impact the other outcomes.

We located a study that evaluated a form of this strategy in practice in isolation. Duhon et al. (2009) evaluated performance feedback within a team setting compared to individual feedback in relation to a response to intervention (RtI) intervention. Only eight teachers participated in this multiple baseline design. Performance feedback delivered in a team setting either improved fidelity or maintained it across two experiments. Authors argue that part of the rationale

for the impact of feedback received in a group setting was it aiding communication, understanding, and accountability. Although the reflection was very directed here given that feedback was delivered by the researcher, it does suggest that team meetings can be used by those delivering an intervention to review progress and adapt their practice.

Roy et al. (2018) reported in their evaluation of mixed attainment teaching that a factor interviewees identified as supporting successful implementation was being given opportunities to discuss and share their experiences delivering the intervention.

Freeman et al. (2014) found that the core implementation team organised time in other staff meetings to discuss the intervention in a study interviewing implementation team participants about factors that facilitated implementation of a whole-school conflict resolution programme. This has been used to argue that these reflective meetings can impact adoption and that such meetings to reflect on intervention practice should be integrated into existing regular meetings (Baffsky et al., 2023).

Team meetings may help to sustain practice by ensuring that new staff are able to learn from other staff more experienced with the intervention, as well as bring new ideas. Andreou et al. (2015) interviewed 17 participants involved in sustaining School-Wide Positive Behavioural Interventions and Supports over several years. Having strategies to help new staff was reported as beneficial by participants, therefore all new staff were encouraged to join a team, not just to learn about the intervention but to introduce them to the school, its culture, and help develop their teaching. The process of changing team membership with newer staff also helped refresh the intervention.

One element of this strategy relates to the organisational structures that facilitate implementation considered above (organise and protect time for team meetings). However, the second element describes active processes which occur when the opportunity to meet is given (e.g. reflect, share, and support). Literature supports this distinction and indicates there may be an overlap and dynamic relationship between them, which together influence how successfully teams can reflect upon implementation. Judkins et al. (2019) explored the contribution of team organisation, leadership capacity and processes in a study with 19 high schools implementing School-Wide Positive Behaviour Interventions and Supports (SW-PBIS). While it must be noted that teams here are more akin to core implementation teams and their functioning, as measured by the Team Functioning Index correlated with intervention fidelity, the key finding in relation to this strategy was the strong correlation between SW-PBIS fidelity and the process elements of the teams' work (such as using an agenda, staying on task, reviewing data, and their decision-making processes). Judkins et al.'s work suggests that these process elements may have greater influence on the quality of meetings than structural aspects (e.g. frequency of meetings, assignment of roles).

This process of discussing and addressing challenges and possibilities with the new approach has been shown to build greater depth of knowledge about the new practice, build confidence in the final product, and facilitate project progression due to having time to work on shared goals. Similarly, team meetings which encourage active involvement and communication can facilitate reflection via the sharing of information and experiences (Cheung Kong, 2019).

Guhn et al. (2009) reviewed literature to synthesise factors that helped to sustain two school reform programmes. They found that frequent and structured opportunities for school staff who are delivering an intervention to exchange experiences, discuss problems, and observe each other's practice is a driver for sustaining interventions.

Mclsaac et al. (2015) completed an exploratory mixed-methods case study focusing on the implementation of Health-Promoting Schools in nine Canadian schools. Their analysis showed that in the four schools sustaining their health-promoting schools practice, there was greater staff collaboration and support for this.

In summary, a mix of evidence across different designs including two reviews, two quantitative studies, two mixed-methods studies, and three qualitative studies demonstrate the beneficial impact of forming reflective teams of implementers on outcomes that include adoption, fidelity, and sustainability. The evidence reviewed suggests beneficial outcomes when these reflective meetings are collaborative and supported over time, starting before delivery, so that they can continue to help implementers share good practice and address problems.

What does the evidence tell us about how the strategy works well?

Moore et al. (2021) conducted a retrospective study which identified implementation strategies that were used to support the efficacy of a universal, trauma-informed prevention programme for 13- to 14-year-old students in the U.S.A. Weekly meetings with community mentors and intervention group leaders discussed implementation.

Gunderson et al. (2021) conducted qualitative interviews with school staff implementing evidence informed practices to reduce suicidality among LGBTQ high school students to identify SISTER implementation strategies that were used. Schools were supported to use the Dynamic Adaptation Process, which combines several implementation strategies. As part of this an implementation team is established in schools. Although this team made decisions about the intervention, they also had meeting time focused on peer support, lessons learned, and reflection. Across schools only four teams received protected time, in most schools meeting attendance was voluntary. The study did not explore the impact of this, although participants expressed that leadership support was needed (more so for professional development).

Teams may find it challenging to achieve regular attendance at meetings regardless of their size (March, 2020). However, Pearlman (2005) suggests that the impact of team meetings is more likely to be determined by the processes that occur within meetings, such as approaching tasks with a positive attitude, being enthusiastic, decisive and proactive.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Malloy et al. (2015) evaluated the influence of teachers' ratings of school climate on fidelity of Positive Action, a socio-emotional and character development programme in 18 elementary and middle schools. Although the focus of data collection was not on reflective teams, the study does show that stronger teacher-teacher affiliation predicted more use of supplementary activities and resources. The authors assume that stronger affiliation led to more sharing of these resources and sharing of ideas. Teacher-teacher affiliation might then be a facilitator of reflective practice through team meetings and other avenues.

It is important that school leaders commit to planning and protecting time for ongoing meetings to take place between staff delivering a new intervention. It demonstrates that staff are encouraged and supported to reflect as a group and share knowledge and skills. Van Geel et al. (2017) evaluated how school characteristics were related to the combined assessment of fidelity, reach, and teaching performance after using a data-based decision-making intervention and sustaining the intervention after two years in the Dutch primary school context. All school leaders met with project staff to assure that they would allocate sufficient time to staff delivering the intervention. Lower levels of the implementation outcomes were characterised by school leaders who did not provide enough time for staff to work together on the intervention.

Likewise, Fisher et al. (2020) show that adoption and sustainability can be negatively impacted where school leaders do not prioritise time for team meetings. Their process evaluation of mental health first aid and peer support for secondary school staff showed that across schools where implementation outcomes in relation to the training varied, staff found difficulty to meet and no groups were meeting regularly after a year. It was recognised that this meant staff using the intervention could not reflect on practice and consider changes. Staff identified challenges to find time and space; the authors argue that the meetings would need to be acknowledged as part of roles and with greater prioritisation from school leaders.

What does our realist review show are relevant contexts and mechanisms?

This strategy demonstrates the relationship between the context, *enabling structures* and the mechanisms of *reflection* and *uniting*. Evidence suggests that the key enabling structure is to protect time for team meetings to occur (Crane et al., 2021; Judkins, 2019). This is an organisational decision which can provide the conditions for implementers to share knowledge, discuss, and address challenges and solutions. Protecting time communicates the message that the new intervention is important and that the available support is consistent and equally accessible to all staff members. Where time is not protected for implementer meetings, support may be more likely to occur on an ad-hoc basis, or be limited to staff members with strong existing working relationships (Markette, 2013). There is also some evidence that the team meetings need to be supported by school leaders as *agents for change*, therefore providing opportunity for agency within the meetings (Fisher et al., 2020; Gunderson et al., 2021). Team meetings can provide a coordinated opportunity for staff to engage with discussions about the implementation effort. *Reflecting* together can build a greater sense of cohesion and collective effort, sometimes uniting knowledge about the intervention (Cheung Kong, 2019; Miller et al., 2015). Whilst teams need to acknowledge and discuss challenges and barriers, it is important that team meetings maintain a positive attitude and return to discussing solutions for this strategy to facilitate implementation progress (Pearlman, 2005).

Our realist synthesis indicated the interaction of enabling structures and reflection impacting buy-in and other implementation outcomes as indicated in the ICAMO configuration below.

ICAMO configuration for organise practitioner team meetings

When organising school personnel implementation team meetings, evidence suggests the importance of the contexts of *enabling structures*. The literature suggests that schools will need to enable this strategy by designating time for teams to meet and therefore show that staff discussion and reflection is a valued aspect of the implementation process. In addition, team meetings can be viewed as an opportunity to develop the skills of those who will drive change as they will be implementing the intervention. Team meetings can provide a platform to develop one another's skills. This strategy applies to teams of individuals who are responsible for delivering the new practice, as well as core practice implementation teams (see Strategy 48 above) that are responsible for managing the overarching implementation plan at a whole-school level. When team meetings are established, this provides the opportunity for team members to engage in reflection of their individual and collective skill sets, experiences of implementation, and ways to support each other to develop in line with implementation goals. Using this strategy can help schools to develop the skills of their staff members and the group process may also contribute to building a sense of cohesion and later sustainability. These outcomes would contribute to greater fidelity to the core principles and practices of the programme.

The key components of this ICAMO configuration are shown in the table below along with the evidence informing this synthesis and confidence rating.

Implementation Strategy 32: Organise school personnel implementation team meetings				
Develop and support teams of school personnel who are implementing new practices and give them protected time to reflect on the implementation effort, share lessons learned, and support one another's learning.				
Context	Actor	Mechanism	Outcome	Evidence
Enabling structures (protecting time for meetings, structuring them).	Those implementing the new practice, school leaders protecting time.	Reflecting (on one's own skills set, what can be learnt from colleagues and on experiences of implementation).	Buy-in Adoption Fidelity Sustainability	Judkins, 2019 ; Cheung Kong, 2019; Leung et al., 2020; Markette, 2013; March, 2020; Miller et al., 2015; Pearlman. 2005 ; Andreou et al., 2015; Duhon et al., 2009; Freeman et al., 2014; Guhn et al., 2009; van Geel et al., 2017; Fisher et al., 2020; Roy et al., 2018.
CERQual confidence rating: Moderate				

Summary

A range of evidence, more often qualitative research than reviews, shows the impact of having practitioners meet to share their views and consider data about the intervention they are using. The evidence also speaks to the importance of protecting time for this and suggests considering existing meeting or communication structures to allow this. The review finding is particularly coherent. The strategy and evidence speaks directly to the importance of both enabling the meetings to happen with regularity and reflection as a key part of the meeting. The only minor concerns are around the methodological limitations and adequacy of the evidence. What prevents a higher rating is the variation that might be possible in terms of the reflection, which appears to range from analysis of performance data to sharing concerns. Also, it is unclear from the evidence what impact this reflection has on outcomes versus other strategies that might be ongoing or if alternative formats to meetings may also be beneficial. The ICAMO is therefore rated with a moderate level of confidence.

10. Stage implementation scale-up

SISTER Strategy 10, 'stage implementation scale-up', is defined by Cook et al (2019) as phasing 'implementation efforts by starting with small pilots or demonstration projects and gradually moving to a system wide rollout' (p. 920). It is classified as an evaluative and iterative strategy. We assume that another strategy can be subsumed under this one: Strategy 3, 'conduct cyclical small tests of change' (piloting or trialling the practice first).

To what extent does the evidence indicate outcomes?

A limited amount of evidence indicates that staging implementation scale-up is linked with implementation outcomes including buy-in and penetration. A study using a multiple case study design interviewed 15 primary and secondary school teachers, school coordinators, project coordinators/managers, funders, and intermediaries to explore the barriers and facilitators to adoption, implementation, and sustainment of obesity prevention interventions in schools (Hayes et al., 2019). The study found that constructive feedback, when received by supportive and engaged staff, helped to adjust practices in ways which helped scale-up and sustainability. Allowing implementers the discretion to adapt practices in response to pupil and contextual need was perceived to strongly support implementation efforts and was linked with greater buy-in and penetration of the approach throughout the school. We did not locate other research that indicated direct impact of scaling up an intervention as a discrete step in implementation on outcomes.

What does the evidence tell us about the situations in which schools might use this strategy?

Evidence suggests that staging implementation scale-up is valuable dependent on the nature of the intervention (Barker et al., 2016). For example, when implementing a whole-school approach to behaviour management, a universal health promotion policy, or to develop a love of reading amongst the school community, the aim of the implementation is to affect the entire school community and its environment. In these scenarios, considering how practice will be piloted and then rolled out more widely is crucial to ensuring the feasibility of an approach gaining traction over time (Pearson et al., 2015). On the other hand, where an intervention aims to target a smaller group of pupils or an isolated practice—for

example, to introduce self-registration to build autonomy or to improve the way mindfulness is approached in the Early Years Foundation Stage (Holt et al., 2022)—then scale-up may be less relevant. The nature of the intervention, its characteristics, and aims all factor into the degree of scale-up that will be required.

What does the evidence tell us about how the strategy works well?

When considering the scope and shape of scale-up in relation to an intervention, evidence suggests that considering schools as complex adaptive systems can help to support effective scale-up.

In a review of evidence which examined the factors linked to the sustainability of evidence-based practice in schools (Koh and Askill-Williams, 2021) researchers found that it may be helpful to look beyond well evidenced elements linked to sustainability such as ‘administrative support, consistent resources, and staff stability’ and move toward a deeper understanding of how factors such as ‘engagement and involvement of stakeholders, adaptability and flexibility to manage change, and formation of collaborative partnerships’ help to make sense of other known factors (p. 308). For example, recognising schools as complex adaptive systems may help to build resilience to ongoing change by deepening awareness of how actions taken influence and shape other actions. This degree of awareness and recognition of the non-linear school context may help to bridge and integrate logistical and relational implementation strategies in ways which strengthen impact.

Charlton et al.’s (2020) evaluative study of the implementation of a Multi-Tiered System of Supports framework for organizing and integrating academic, social, and emotional supports within the U.S. school context found several factors that helped to facilitate scale-up. Systems that support data collection can help aid scale-up. These factors included supportive systems, facilitative administration, and evidence-based decision-making. In the context of decision-making, the study further found that in the presence of user-friendly data systems, accessing and using the data became self-sustaining, which helped to support scale-up. However, the researchers also note this required a ‘significant investment’ from the implementation team. Moreover, they also found that in some schools the leadership team may not have utilised the data system because it was ‘too difficult to use, or the team may have lacked sufficient administrative support’ (p. 166).

In Hayes et al.’s (2019) case study which examined the barriers and facilitators to adoption, implementation, and sustainment of obesity prevention interventions in Ireland, the findings contend that successful implementation and scale-up of public health anti-obesity interventions in schools is dependent on ‘good contextual fit, engagement and leadership at multiple levels and secure funding’ (p. 11). Recommendations to overcome barriers include building the capacity to deliver within an already overcrowded curriculum and ‘clear specification of intervention components within a conceptual framework to facilitate evaluation’ (p.11). The evidence seems to suggest that a range of ongoing support, including use of other strategies, will support implementation scale-up.

What does the evidence tell us about factors that enhance or hinder the impact of the strategy?

Factors that enhance or hinder the impact of staging implementation scale-up include the ‘availability of financial resources and changes in policy and procedures’ (Koh and Askill-Williams, 2021, p. 308). The presence of, and engagement with, these factors at the school level are linked to greater sustainability. Where the outer school context also provides financial support or there is an alignment with policy, this can reinforce the inner school level and provide chances of sustainable scale-up. Having sufficient time to work through processes of implementation is also an enabling or hindering factor. Initiatives which aim to build capacity, form meaningful collaborative partnerships, and facilitate broader system change ‘typically require a long period of progressive implementation and diverse efforts to scale up and sustain’ (p.308).

However, there are multiple drivers which influence the degree of time that is allocated to implementation within schools. Leadership—as those with authority over timetabling and scheduling—play an instrumental role in this aspect and leaders navigate a range of factors which influence their decision-making around time (Savage et al., 2011). These drivers can include opportunity and preferences (the extent a leader is willing to de-implement other practices to create more time for new practices), capability (to recognise and understand the non-linear and often protracted process of implementation scale-up), and motivation and incentives (willingness to avoid short term wins in favour of working towards longer term goals).

A qualitative study with school leaders in 20 U.K. schools by Penlington et al. (2008) contends that leadership vision for implementation enhances or hinders scale-up efforts. In successful schools, Penlington et al. found that headteachers were focused on the future, perceiving challenges or opportunities. Other factors supported scale-up including establishing a culture of change, distributing leadership, building capacities in other staff, and recruiting high quality staff. These enhancing factors are further supported by the findings of De Brún and McAuliffe’s (2020) realist study of collective leadership evidence, which found that a lack of organisational support and resources and a strong hierarchical culture undermined scale-up of implementation and was associated with disempowering staff, undermining staff confidence in the approach, and less teamwork (De Brún and McAuliffe, 2020).

What does our realist review show are relevant contexts and mechanisms?

Our programme theory constructs resonate with the elements involved in staging implementation scale-up found across evidence. *Enabling structures* provide the logistical support mechanisms in which to test-drive and select practices with a view to scaling up practice (Austin et al., 2011; Bingham et al., 2018; Moore et al., 2021). *Agents for change* undertake the collection and dissemination of data and *engage* in collective processes of meaning-making with colleagues to better *unite* understanding around the links between practice and outcomes and how this understanding can evolve practice for the betterment of implementation and pupil outcomes (Comiskey et al., 2015; Crawford et al., 2020).

However, our analysis of the evidence suggests that the *intervention* itself shapes scale-up in several influential ways (Moore et al., 2021). The type of intervention and its specific objectives and characteristics all play a role in the forms of scale-up that are appropriate and feasible (Bogiatzis-Gibbons et al., 2021). For example, a whole-school intervention to improve behaviour for learning is likely to warrant a larger more comprehensive and holistic scale-up than an intervention for Key Stage 1 children with a specific learning need which impacts their learning of phonics. Therefore, *reflecting* on the characteristics of the intervention enables appropriate and feasible scale-up to be planned and implemented.

ICAMO configuration

Intervention features should be considered from the outset, in particular the fit with school context, objectives, and resources including funding and core components. The adaptability will be important to consider in planning for scale-up. Planning for the intervention delivered at scale will help to make sure that pilots are focused on what can be effective across a school or trust rather than what is possible only under ideal conditions with unsustainable resources. Implementation leaders are key actors here in terms of planning this scale-up and monitoring it over time. If there is continual reflection on a range of data, this helps to ensure organisational structures are able to absorb the gradual roll out of an intervention and flexible enough to absorb necessary changes. It is important that this reflection is not only geared towards problem-solving ahead of further scale-up, but allows for evaluation of whether an intervention can be sustained. When this reflecting helps to guide further scale-up it will support further penetration of an intervention and sustainability. These outcomes will be seen when there are planned opportunities to review and, if necessary, de-implement the intervention, when further scale up is not feasible, or intervention outcomes are not beneficial.

Implementation Strategy 10: Stage implementation scale-up

Phase implementation efforts by starting with small pilots or demonstration projects and gradually moving to a system-wide rollout.

Context	Actor	Mechanism	Outcome	Evidence
Intervention features: staging scale-up should consider intervention objectives, requirements, and core components alongside organisational capacity for successful scale up from the start.	School leaders/implementation leaders.	Reflecting: on a range of data helps to plan the structures needed to support ongoing practice at a greater scale and to absorb necessary changes.	Penetration Sustainability	Austin et al., 2011; Comiskey et al., 2015; Bingham et al., 2018; Crawford et al., 2020; Moore et al., 2021; Bogiatzis-Gibbons et al., 2021.

CERQual confidence rating: Low

Summary

There is evidence that staging implementation scale-up is a beneficial strategy for schools to undertake in isolation or alongside other strategies such as SISTER Strategy 18, 'test-drive and select practices'. Our realist analysis suggests that reflecting on the characteristics of a particular intervention is instrumental in ensuring that scale-up is appropriate and feasible. While the ICAMO configuration helps indicate the process of scaling up an intervention and justifies this being planned from the outset, there are concerns about the adequacy of literature that demonstrates this occurring. The ICAMO configuration for staging implementation scale-up is therefore rated with a low confidence rating. More research is needed into the relationships between scale-up and specific strategies as well as the role that de-implementation plays in scale-up processes.

Work package 4 discussion

Summary

We conducted a realist review to understand how and why implementation in schools leads to particular outcomes. We consolidated initial analysis that was organised by implementation phase and key domains relevant to implementation to identify three contexts and three mechanisms that often work in terms of a context helping a mechanism to drive an implementation or its outcomes. The three contexts are conditions that can enable or constrain mechanisms during implementation. The mechanisms are the underlying processes or social structures that can be triggered in the right context. Implementation climate is included in our model as we found evidence that implementation in schools is both influenced by previous experiences of implementation and therefore beliefs about future implementation, while any current experience of implementation provides learning to shape the beliefs and capacity that indicate implementation climate.

Further synthesis of implementation strategies showed application of the refined programme theory. We specified ICAMO configurations for each implementation strategy analysed (implementation strategy – context – actor – mechanism – outcome) showing the evidence that indicated how contexts, mechanisms, and outcomes from the refined programme theory were relevant to 34 strategies that had some evidence for their impact in reviews or empirical literature.

Programme theory

A good range of evidence informed our realist synthesis and refined programme theory; 295 included papers is a large number for a realist review but the scope was very broad in terms of all school implementation. We anticipated that more studies would be from health fields given the prevalence of existing TMFs and literature in this area. We also expected more qualitative studies to focus on exploring and evaluating implementation factors in school settings. However, more of our included papers focused on any teaching and learning interventions than physical and mental health together. There was also a relatively even mix of reviews, quantitative, qualitative and mixed-methods studies. As is typical for a range of educational research, most papers were U.S. based. Drawing on EEF-funded evaluation reports meant that over a sixth of included studies were U.K. based.

We provided some examples of how we moved from synthesis in line with our initial programme theory to our refined programme theory in Appendix 15 but could add some further worked examples of how sources were used to evidence either refined programme theory constructs or ICAMO configurations for implementation strategies.

Implementation climate appears as part of the refined programme theory as a property that is present and linked to other components: rather than being an element that provides a condition for specific actions or underpinning strategies when they are more effective, it holds relevance to implementation in a holistic way. Indeed, we located some evidence to suggest that implementation in schools is both influenced by previous experiences of implementation and, therefore, beliefs about future implementation, while any current experience of implementation provides learning to shape beliefs and capacity enabling us to predict that conducting implementation in ways that fit the refined programme theory and improving outcomes also enhances a school's implementation climate. This then helps to recognise the kinds of contexts that need to be in place or maintained to support future implementation.

We deliberately sought contexts that were active and dynamic rather than static, contextual factors like school phase, meaning that the three broad contexts will resonate across the range of implementation settings. There is some overlap between them and other classic definitions of context in realist evaluation and synthesis. Pawson (2013) specifies 'contexts' as fitting one of four I's: individuals, interpersonal relationships, institutional settings, and infrastructure. There is overlap between our context of enabling structures and institutional settings and infrastructure. Likewise, 'individuals' and 'interpersonal relationships' resonate with agents for change. This indicates how positioning features of the intervention as a key context for implementation is novel in realist syntheses.

Links between the refined programme theory and other models

There are some shared features between our refined programme theory and the Consolidated Framework for Implementation Research (CFIR). Under the CFIR 'innovation' domain there are contexts that fit our 'intervention features' like evidence-base, adaptability, complexity, available resources, and compatibility—although our 'intervention features' context arguably focuses more on fit and feasibility. Aspects considered under the CFIR 'inner setting' relate, in part, to other refined programme theory contexts: 'work infrastructure', for example, includes some enabling structures and 'relational connections' describes part of agents for change. Under the implementation process domain are constructs that appear to be like two of the refined programme theory mechanisms, although they are narrower in CFIR. Engaging in CFIR related to attracting and encouraging participation. Reflecting and evaluating in CFIR relates to the use of data.

There is also some overlap between Promoting Action on Research Implementation in Health Services (PARIHS) and the refined programme theory. PARIHS sees the interaction between evidence, context, and facilitation as key to

implementation in health services. Evidence and context within PARIHS share aspects of ‘intervention features’, including research, relevance to the school, and fit with school. Facilitation, when it is geared towards enabling and empowering others in PARIHS, fits well with ‘agents for change’, where facilitation and degree of empowerment were aspects of this context in scope.

Other TMFs that we located and synthesised as part of Work Package 1 tended not to share that many features with our refined programme theory. There was more overlap between some of these (e.g. Getting to Outcomes, Quality Implementation Framework, and Conceptual Model of School-Based Implementation) and the SISTER strategies. This is likely to be indicative of the stage-based nature of these practical models. Compared to other TMFs, the refined programme theory may appear to de-emphasise a socio-ecological model that recognises different levels of the system ranging from individuals directly involved to organisations beyond the school. However, the three contexts in the refined programme theory all recognise the importance of conditions set by intervention developers, funders, and local and national legislation.

In reviewing and refining our refined programme theory during the realist synthesis, we became aware of some other models that share similarities. Coe et al. (2022) conducted an evidence review on the school environment and leadership. Although the review focused on literature related to school climate and leadership primarily some of the reported characteristics that are potentially important determinants of student attainment include leadership trust, shared values, collaboration, community relationships, distributed leadership, and evaluation. These link to all three mechanisms of the refined programme theory and the context of ‘agents for change’. Although Hite’s (2022) ‘collective efficacy’ refers to school staff’s belief about their impact on pupil’s outcomes, the enabling conditions in this model link well to several components of the refined programme theory. Goal consensus and cohesive knowledge fits with the mechanism ‘uniting’; empowered teachers fits with the context ‘agents for change’; and embedded reflection fits with the mechanism ‘reflecting’.

Quality

We conducted and reported our realist synthesis following RAMESES guidelines. We were able to do this across the board.

We rated both our refined programme theory constructs and realist ICAMO configurations for each implementation strategy using CERQual appraisal of review findings. We hold high confidence in our contexts ‘enabling structures and mechanisms’, ‘uniting’, and ‘reflecting’. We hold moderate confidence—meaning some slight concerns—for the other constructs. For the context ‘agents for change’, there are some slight concerns about the coherence of this review finding because it is sometimes challenging to distinguish between ‘agents for change’ as a condition that supports implementation and the actions of agents for change that can be considered under each mechanism. For ‘intervention features’ we hold minor concerns about the adequacy of the evidence representing the range of intervention features that we specify. It is noteworthy too that ‘intervention features’ represents a context that is more a set of varying factors related to the intervention that fits a school’s need, compared to the conditions of ‘enabling structures’ and ‘agents for change’ that a school can potentially identify and put in place to support implementation. We hold slight concerns about the coherence of the ‘engaging’ mechanism review finding. There is some potential overlap in that collaboration may involve reflection and increased interest in an intervention may also help unite values about the intervention. Our realist analyses of implementation strategies tended to be rated as low or moderate confidence, often because of the adequacy of data from the included studies that show how the refined programme theory can help to explain the use of the strategy or coherence of the evidence that conducting the strategy in the way indicated will itself directly impact the indicated outcomes.

The only issue related to assessments of study quality tended to be reviews that at times were rated as lower quality because they focused on aspects of implementation rather than a typical intervention-focused systematic review. However, in relation to how well the included studies help to address the research questions there are two points of quality to note. First, it is challenging to isolate a dimension like ‘leadership’, a factor like ‘fit of the approach’, or a strategy like ‘professional development’, from the range of other interacting components and actions or specify exactly what the right kind of leadership, level of fit, or type of professional development would be across all contexts. Second, we found more evidence of components of implementation having some impact on implementation outcomes rather than directly upon pupil outcomes.

For the impact of implementation strategies, again we found little evidence of the isolation of individual implementation strategies to measure their causal impact on implementation or pupil outcomes. Indeed, several studies and reviews report and make the argument for a combination of implementation strategies being used in school settings rather than one being sufficiently effective to use in isolation. Those studies that have reported on the incremental impact of using one implementation strategy, versus not, are understandably small scale. There is relatively little evidence that shows a direct impact of using one implementation strategy on pupil outcomes. Although, usefully, some studies do indicate how the impact of implementation strategies on pupil outcomes is through their more direct impact on implementation outcomes, often fidelity.

Limitations

Arguably, we might have included more detail about the included papers in Appendix 16, both in relation to the studies and their use in the realist synthesis; for instance, we might have included a summary of their main findings or the use made of the study in the synthesis. However, with 293 included papers and the aim and main findings of included papers not always the relevant aspect in relation to our synthesis we did not include this detail. Work Package 3, Evidence Map 2 (see page 69) also indicates which studies contributed to different refined programme theory elements and implementation strategy analyses. We have therefore been clear in the evidence we have used to reach the range of findings.

There is scope for further analysis to consider the interactions between contexts and between mechanisms. For instance, what are enabling structures for particular intervention features and what do intervention features suggest agents for change need to focus on? Likewise, when is 'engaging voices' a precursor to reflecting on these views and feedback and when is 'engaging interest' in an intervention likely to support uniting values and understanding about the intervention? This would have been complicated to evidence and involve time consuming further analysis. Our realist synthesis focused on connections between contexts, mechanisms, and outcomes rather than within contexts or mechanisms.

Implementation strategies

To address our research question on the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practices in schools, we used the SISTER taxonomy of implementation strategies (Cook et al., 2019). This taxonomy drew upon the well-established and used Expert Recommendations for Implementing Change (ERIC) project (Powell et al 2012) from broader implementation science that has been applied in a range of community settings, applying this to schools specifically. The two key SISTER papers had been cited by 138 papers when we searched their citations in January 2023, indicating the use of the taxonomy to date, although relatively few studies have used it as a basis for investigating implementation in schools so far. As such, we are confident the taxonomy is a comprehensive, evidence-informed set of school-based implementation strategies.

However, there are some challenges in relying on the taxonomy to provide a wealth of strategies across implementation as a process. First, studies that have used SISTER to date and indicated implementation phases put the vast majority of strategies as either preparing or delivering. There is a paucity of strategies related to exploring and sustaining implementation, particularly strategies to support exploring a need and selecting the right intervention. Given the focus on intervention features in the refined programme theory and the interaction between the intervention and implementation action across work packages in this evidence review, there is a clear gap for implementation strategies in relation to selecting the right intervention for school needs.

Sometimes terminology used as part of strategies can be confusing. For instance, the strategy about 'practice teams' relates to implementation teams that lead implementation decision-making, whereas 'implementation team meetings' refer to reflective meetings held between implementers. Some terminology like 'local consensus discussions', 'blueprints', or 'local opinion leaders' may not be very familiar to schools. When considering evidence for SISTER strategies, most of the evidence was not referring to the SISTER strategies specifically so we did not always find evidence that was unique to multiple similar strategies. At times we did not find very much evidence for strategies either (Appendix 19). This meant we reviewed 34 of the 72 strategies.

The SISTER taxonomy presents 72 strategies categorised conceptually. We have added to this by reviewing evidence for the impact of around half the strategies and using our refined programme theory to explain the contexts and mechanisms that hold evidence to show how the strategy can enhance outcomes. However, other studies may consider bespoke implementation strategies for a particular intervention or consider strategies together, rather than separately, which may be helpful given evidence suggests that very often multiple strategies are used together to support implementation (Baffsky et al., 2022, 2023). For instance, the Dynamic Adaptation Process involves several discrete implementation strategies, such as readiness assessment, identification of champions, coaching, and ongoing feedback (Aarons et al., 2012).

At times, the constructs from the refined programme theory that we found the clearest evidence for being related to implementation strategies may be unexpected. For instance, 'assess for readiness and identify barriers and facilitators' is categorised by Cook et al. (2019) as an evaluative and iterative strategy but we found evidence to suggest that it is important to engage a range of stakeholders in this assessment to be able to address shortfalls in readiness and the range of barriers. Strategies falling under 'train and educate stakeholders' all aim to unite understanding about an intervention or implementation and are evidenced as improving fidelity. However, sometimes the nature of the eight different professional development strategies we analysed meant the important underlying mechanism for the particular strategy was not uniting. For instance, 'make training dynamic' evidenced the importance of engaging training and 'providing ongoing training and coaching' evidenced how this ongoing professional development allowed reflecting on needs, notwithstanding the overarching aim of professional development strategies to unite knowledge and understanding about a new intervention or implementation more generally. This could be seen as a limitation of the realist approach that seeks to identify evidenced causal configurations to explain actions. While mechanisms were often

all relevant to a specific implementation strategy, we prioritised the one that was evidenced as being an underlying driver of the implementation strategy having beneficial effects as we very rarely found a causal link from one mechanism to another (see Strategy 57, ‘involve students, families, and other staff’, for an example).

The implementation strategy analysis helps to provide practical examples of how the refined programme theory can underpin clear action that schools can take when implementing new approaches. An associated benefit of the ICAMO analysis is that it helps specify for whom implementation strategies impact on outcomes. While the refined programme theory helps evidence how, why, and for whom implementation strategies can impact outcomes, some of the strategies are related to each other. As such, schools need to consider not only how to use a strategy but first consider whether selecting a strategy implies that another strategy should then be used too. For instance, facilitating a relay of intervention fidelity and student data necessitates the prior strategies that develop and organise a monitoring system and instruments to evaluate delivery of core components. The broad implementation strategy that involves tailoring strategies indicated other strategies are tailored to address barriers and leverage facilitators, so previous assessment of these are necessary.

Finally, we considered how best to summarise the 34 implementation strategies we analysed, either in terms of categorising or prioritising those that should be more strongly recommended. This was challenging: organising strategies by refined programme theory contexts, mechanisms, or outcomes would wrongly give the impression that it is better to select one strategy in isolation. Quality indicates more about the evidence base to date rather than the potential for strategies. SISTER strategies are not always intuitive or place related strategies together. We therefore categorised the 34 strategies into eight meta-strategies, loosely ordered by phase of implementation. We suggest that for sustained implementation of a new approach each of the eight will be necessary, but the individual strategies used may vary or be tailored. Limitations indicated previously hold in relation to a lack of strategies that explore the selection of the approach and others related to sustaining and maintaining the approach over the long-term.

Table 21: Eight meta-implementation strategies and the individual strategies that can be utilised for each

A Assess and address needs and context

- 4 Conduct local needs assessment.
- 1 Assess for readiness and identify barriers and facilitators.
- 23 Conduct local consensus discussions.
- 57 Involve students, family members, and other staff.
- 17 Tailor strategies.
- 8 Obtain and use student and family feedback.
- 12 Facilitation/problem-solving.

B Develop and revisit an implementation plan

- 5 Develop a detailed implementation plan or blueprint.

C Prepare for and carefully adapt the new approach

- 22 Capture and share local knowledge (meaning other schools too).
- 60 Access new funding.
- 18 Test-drive and select practices.
- 68 Change/alter environment.
- 74 Pruning competing initiatives.
- 41 Develop educational materials; 42: Distribute educational materials.
- 16 Promote adaptability (careful balance between adapt to context and needs, preserving fidelity).

D Identify and empower key people

- 26 Identify and prepare champions.
- 28 Inform local opinion leaders.
- 48 Create new practice teams (this is implementation team).

E Organise high quality PD and coaching

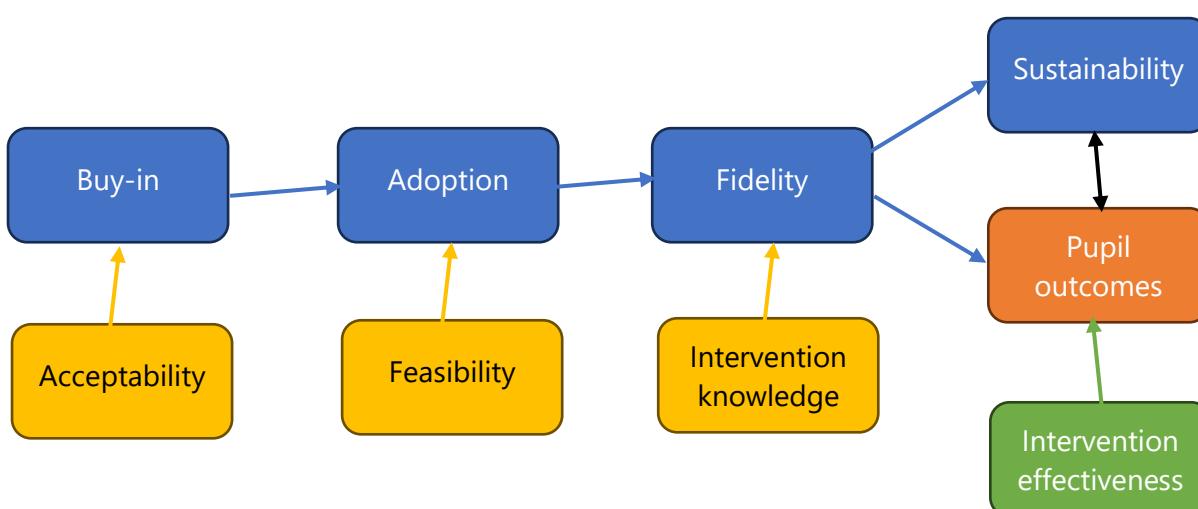
- 34 Recruit, designate, and train for leadership.
- 43 Make training dynamic.
- 38 Conduct educational outreach visits (this strategy is credible expert coming to site).
- 45 Shadow other experts—observing the approach in practice (in/out of school).
- 46 Use train-the-trainer strategies.

- 39 Conduct ongoing training; 44: Provide ongoing consultation/coaching.
- 14 Provide practice-specific supervision; 30: Model and simulate change.
- F Support implementers**
- 51 Improve implementers' buy-in.
- 53 Remind school personnel (about core components to be delivered).
- 54 Targeting/improving implementer wellbeing.
- 61 Alter and provide individual- and system-level incentives.
- 32 Organise school personnel implementation team meetings (implementers meeting to reflect).
- G Monitor and respond to data**
- 6 Develop and organise quality monitoring system.
- 7 Develop instruments to monitor and evaluate core components of the innovation/new practice.
- 50 Facilitate relay of intervention fidelity and student data to school personnel.
- H Sustain and continue to develop implementation**
- 10 Stage implementation scale-up.

Outcomes

An important element of the programme theory is the evidenced link between implementation outcomes and intervention outcomes (often pupil outcomes). This demonstrates the importance of appreciating and measuring implementation outcomes as often indicated through the 'enabling structures' context and 'reflecting' mechanism. Implementation outcomes are necessary but not sufficient for intervention outcomes. For instance, an intervention needs to be adopted to have a chance of benefiting pupils, likewise an intervention needs to be sustained to maintain any positive benefits that may have been realised over time. Fidelity is most often evidenced as being related to intervention outcomes, which makes sense as fidelity is the degree to which an intervention is put into practice as conceived and planned, however, fidelity alone does not guarantee pupil outcomes. Given that pupil outcomes may take time to be impacted the quality, appropriateness, and potential of the intervention will ultimately be amplified when it is implemented well. Attending to adoption, fidelity, and sustainability will decrease pupil outcomes if an intervention has a negative effect (e.g. Humphrey et al., 2020).

We have further considered the link between different implementation outcomes and intervention outcomes and suggest the following relationship that shows how key implementation outcomes relate and how these outcomes directly influence—but do not fully predict—intervention outcomes:



Finally in this discussion of Work Package 4 we consider two overarching factors that have been inherent across the evidence review and are relevant across the refined programme theory, rather than specified as a construct: time and leadership.

Key overarching factor—time

Time, indicated by the phases of implementation (explore, prepare, deliver, monitor, sustain), appears to be more prominent in the WP1 system map and the initial programme theory, compared to the refined programme theory. The latter is not broken down into phases because it is evidenced to be relevant across the phases of implementation, with enabling structures as important for needs assessments to establish a priority area to address versus scaling up an intervention. Likewise, we found that while implementation strategies might often be associated with use during a particular phase, often identified as being 'prepare' or 'deliver', their value as ongoing support is well evidenced. For instance, champions may be agents for change taking on different roles or being fulfilled by different individuals over time. Planning was evidenced to be very much an iterative process rather than a document only completed during the prepare phase. Seeking feedback from families and pupils was shown to involve them in preparation for a new intervention as well as also engaging their feedback on that intervention once it has been put into practice.

Time was a very important part of the refined programme theory even though phases of implementation are not a primary way of categorising the theory. Allocating time to a range of implementation activities was the most frequently evidenced example of an enabling structure we found in our realist synthesis. Insufficient time for either implementation leaders or teacher implementers has been evidenced as a barrier to implementation outcomes (Ismail et al., 2021; Smith and Engelson, 2013). While allocation of time fits the definition of a context well as it is only a condition to then be used to make effective implementation happen, there is evidence that time allocated for key implementation activities such as staff reflection, collaboration, and planning is associated with improved pupil outcomes (Zhang et al., 2021).

Other evidence suggests that allowing enough time may link in with a positive implementation climate in a school. Focusing on the quality and depth of improvement that is occurring across the school as part of the process of implementing an intervention can help sustain an intervention over time, compared to focusing on short-term goals and evidencing change quickly, which may see some improvement followed by losses of momentum as burn-out or other priorities take precedence (Gabby et al., 2017; Gaias et al., 2020; Hall, 2013). Contrastingly, we also located evidence of implementation dip. This is a decrease in performance as implementers change their practices, it is associated with disequilibrium as typical practices are adapted or stopped, often because of either resistance to change or a lack of efficacy to make the change (Fullan, 2001). In a study exploring teachers use of the responsive classroom approach (designed to improve elementary children's social, emotional, self-regulatory, and academic development through the creation of a well-structured and supportive learning environment), their training in the approach and outcomes in terms of interactions with pupils, Abry et al. (2013) explained the lack of impact of training on interactions as due to an implementation dip that might see a mix and conflict between new and old practice. Continuous support during the initial time of putting a new intervention into practice is important and is evidenced as helping teachers experiencing an implementation dip improve even over a short time (Cviko et al., 2013).

However, other research has indicated that implementation dip can occur over a longer-term. McIntosh et al. (2016) examined patterns of fidelity for over 5,000 schools over five years implementing school-wide positive behavioural interventions and supports. One group of schools were categorised slow starters and they started with moderate levels of implementation but experienced an implementation dip in year two. By years four and five they were as likely to be implementing with fidelity as schools that did not show a dip. The authors argue that this supports the view that this whole-school approach needs a timeframe of three to five years to be implemented. This is seen in other literature writing more broadly about school reforms (e.g. Garvis et al., 2013), although here the authors argue that a predictable dip when momentum might stop in years two to three of a reform can be mitigated with several supporting factors including implementation teams, sensitive and sustained school leadership, early adoption, emphasis on problem-solving, and evidence-based planning (Garvis et al., 2013).

Work associated with a popular TMF that we have included in our evidence review has estimated that implementation is a process that is estimated to unfold over two to four years (Fixsen et al., 2009). Although this will vary according to the approach being implemented and the setting, we do not assume that every intervention will take two or more years to implement: across the included studies in our realist synthesis that reported on factors linked to sustainability, the length of time the intervention had been put into practice was at least one year (Austin et al., 2011; Blaine et al., 2017) and was more often two to five years (e.g. Cooper et al., 2015; Firth et al., 2008; Flaspohler et al., 2012; Van Geel et al., 2017).

Key overarching factor—leadership

Roles

The evidence review and previous research emphasises the role of school leaders. The ability to put a new approach into practice and maintain change has been attributed directly to school leadership capacity (Williams, 2009) and their role in addressing teacher resistance to change (James and Jones, 2008). Previous reviews have emphasised management and leadership as a key factor that enables or hinders implementation in schools (Dyssegaard et al., 2017) and, more specifically, identified the importance of factors such as senior leaders' understanding and commitment to new approaches (Anders et al., 2017).

Evidence review focus groups revealed how implementation is intertwined with leadership. This idea is reflected in the review of literature. Rather than be positioned as a separate factor influencing implementation, leadership permeates through the programme theory. Leaders are often key actors changing conditions to enable implementation, facilitating the work of others and actively encouraging behaviours that help bring a new approach into practice and maintain it in the face of other changes.

But implementation leadership does not rest with school leaders or boil down to a broad leadership style: there are a range of key actors involved in implementation in schools, namely school leaders, those with roles and responsibilities to lead and support change in different ways (which we refer to as implementation leaders), and those who are preparing to deliver or are delivering a new approach (often teachers). There are other key stakeholders, including recipients (often pupils) and stakeholders outside of the immediate school setting (e.g. parents and governors) who are important for implementation leaders to interact with.

Implementation leaders might be school leaders, champions, experts in an approach, staff who lead professional development, or members of implementation teams responsible for decision-making.

Structures, systems, and implementation leadership

Enabling structures are often put in place by implementation leaders. Supportive and contextually appropriate structures and systems can help a new approach to be delivered with fidelity and sustained over time.

School leaders are often best placed to facilitate the time needed for colleagues to engage in learning involved in implementation. This might involve other implementation leads developing implementation skills and implementers learning about a new approach. It is important that school leaders commit to planning and protecting time for ongoing meetings to take place between staff delivering a new intervention. Implementation dips might be seen during periods where there are more time constraints, such as examinations or other school events. Leaders can plan for this. Leaders also need time themselves to undertake the initial work underpinning implementation processes such as engaging with evidence, key concepts, and strategies. Too little time can negatively impact on leaders' capability and capacity to lead implementation effectively (Smith and Engelsen, 2013).

Planning the implementation leadership needed in line with the scope and nature of a new approach can help to influence adoption, fidelity, and sustainability (Williams et al., 2022). Establishing clear roles means individuals know who to go to for support, questions, or activities (Massey, 2020). Having clear roles and designated leaders can help with inevitable challenges such as staff turnover (Thaker et al., 2008), this is because it is then often clearer who and what needs to be handed over to others. Leadership and implementation team members will be best placed to access relevant funding, which is often key to make new approaches feasible.

Leaders enabling change

Leaders also hold a key role in supporting and empowering colleagues. This is not separate to establishing roles and making changes to schools to aid the fit and feasibility of a new approach. Enabling structures and change often work in tandem with implementation roles carrying responsibility to build relationships, support colleagues, and engage a range of stakeholders.

School leaders' involvement and engagement of staff in decision-making processes has been strongly associated with acceptability, buy-in, and sustainability of implementation. This was reflected in survey responses that noted implementation leadership was about relationships and ensuring staff feel they are on a journey together.

Implementation leaders who enable change can include champions, local opinion leaders, implementation team leaders and members, those delivering professional development, senior leaders, administrators, and governors.

Enabling change often involves acting as a facilitator, supporting and guiding others to reach shared goals (Wilhelm et al., 2021). This implies using implementation leadership skills to influence group dynamics, cohesiveness around aims and actions, and encourage involvement (Foliano et al., 2019). School leaders need to be available, willing, and able to build trusting relationships and be seen as having high integrity to reinforce trust and so alleviate tensions related to implementation (Elsenburg et al., 2022).

School leaders empower those involved in implementation, shifting ownership of implementation from them to all. Leaders can set realistic expectations for staff, such as a dip in performance around the initial introduction of a new approach. While school leaders should take a genuine and active interest in implementation throughout, there is a balance needed to not be intrusive, thereby enhancing rather than undermining working relationships (Jeffers 2010).

Leaders' intervention, knowledge, and skills

The features of an intervention can direct the kind of structures and support for colleagues that leaders should enact. The complexity and clarity of an intervention can lead to particular implementation leadership behaviours being more critical, e.g. proactive, knowledgeable, supportive, and perseverant regarding evidenced based interventions which predicts fidelity to the new intervention and a stronger implementation climate (Williams et al., 2022).

Implementation leaders can explain why an approach is likely to work and why it is likely to address a gap or need, which helps staff buy-in to the intervention (Ismail, et al., 2021). Distributing leadership can be important depending on the approach. For instance, special educational needs interventions might be improved by distributing leadership as special educational needs educators may have differing but complementary knowledge to school leaders (Williams et al., 2022).

An important feature of interventions is research evidence that can be used to select from amongst approaches and consider fit for the school setting. Support from school leaders is important for wider use of research evidence to improve teaching and learning in schools (Gu et al., 2021). When networks or outside agencies collated and shared resources around recent evidence, school leaders' capacities for engaging with evidence were strengthened (Goldenthal et al., 2021).

Implementation leadership behaviours

Implementation leaders are key in setting the context for implementation in schools; they often support, drive, or model the mechanisms that help lead to improved implementation outcomes.

Implementation leaders can often provide the resources, time, and systems needed to help unite the wider school community around the value of a new approach, and improve knowledge and understanding about the approach and the process of implementation more broadly. Implementation leaders can influence colleagues to buy-in to a new approach by carefully considering its fit with the school setting and the needs that have been assessed. Where people are resistant to change, implementation leaders can demonstrate the anticipated beneficial outcomes of a proposed change compared to previous practice (Gu et al., 2020). This helps to unite staff in valuing the intervention (Drmic et al., 2017).

School leaders' capabilities and capacity to reflect on not only what priorities have emerged but what actions or conditions led to this are considered an influential element of implementation. Interviews with school leaders indicated reflection was discussed as a skill that they felt responsible for fostering among their staff members, which may be achieved through organic, ad-hoc discussion as well as more formalised professional development. Key here and in the wider literature is an understanding that reflecting on what may be challenging and why data may not show strong early progress should be encouraged.

Leaders' own engagement in implementation has been highlighted as associated with penetration, fidelity, and adoption (McLoughlin et al., 2022). School leaders can also encourage active participation, engaging staff, pupils, and families with implementation processes including generating buy-in and exploring motivation and needs (Goldenthal et al., 2021). Engaging with wider groups can focus on the feasibility and acceptability of an approach as well as around potential adaptation (Motamedi et al., 2020). To create positive student perceptions and acceptance of interventions, evidence shows how students can lead in defining and recognising the priority and play a meaningful role in planning for the new intervention (Sadjadi et al., 2021). Implementation strategies must, therefore, consider who is engaged and at what points (Grossi et al., 2019) and make sure that engagement is authentic and meaningful.

Leaders can recognise and conduct personal appeals and introduce incentives as well as provide staff with opportunities for skill and leadership development, assistance, and coaching to help engage staff interest in an approach and achieve acceptability, adoption, and sustainability (Evans et al., 2015; Hollingshead, 2009; Williams et al., 2021).

School leaders and implementation strategies

Many implementation strategies suggest the important role of school leaders enabling change. While often it may be a range of implementation leaders who are facilitating others' contributions and empowering colleagues, we found that school leaders were often champions for an intervention or members of implementation teams (Hudson et al., 2020; Leis, 2017). We also found evidence that school leaders providing supervision and modelling implementation can impact on fidelity and buy-in (McLoughlin et al., 2022).

Early implementation strategies about exploring needs, the school setting, and readiness founded on the idea that change is a process means school leaders follow up these assessments with decision-making, including around the most effective use of finite resources to address the needs of staff and the wider school community. School leaders often put in place these assessments.

Evidence suggests that school leaders play a role in the ways in which readiness is perceived and approached in implementation. Assessing readiness can be a powerful tool for fostering resilient and responsive implementation practices (Gorard et al., 2020).

School leaders can better ensure sustainability from the start by fostering buy-in, acceptability, and feasibility through engaging members of the school community in an active and participatory change process (Hall, 2013). However, these assessments are not one-off activities; when extended over time, leaders were able to more accurately understand where motivation or engagement levels were not sustained.

When buy-in was perceived to be present among school leaders, staff viewed leaders as supportive, involved, and motivated, which in turn provided increased motivation among implementers. Conversely, when buy-in was perceived to be absent among school leaders, school-level champions were often difficult to locate and the acceptance and commitment of school leaders was perceived to be low.

Leaders need to be prepared for the multifaceted and complex demands of leading implementation (Melgarejo et al., 2020), which are different from leading a school or broader school improvement. Evidence suggests sufficient information and expertise needs to be provided to school leaders to know how to best support implementation and then see it maintained (Evans et al., 2015). Evidence suggests leaders are more likely to need professional development when the intervention is new to them. Research suggests school staff view leaders' knowledge in relation to the intervention and pupils needs as the most critical implementation leadership behaviour (Simmons and Martin, 2016). Leaders can have too little time to focus on the implementation of interventions and, in some research, this is a barrier to adoption. Leaders can also overestimate their knowledge leading to less take-up of training themselves.

School leaders also need to be informed about the intervention and potential issues; as they are likely to be addressing staff wellbeing concerns, it also indicates the need for assessing readiness and preparation in advance of delivery. Leaders will need to engage with the staff, listen to, and respond to, their concerns and needs.

School leaders can help support ongoing professional development. Although it might be delivered by other implementation leaders, attendance can be encouraged by leaders, particularly as it relates to implementation outcomes such as buy-in and fidelity. This is particularly the case when using train-the-trainer as a strategy. Trainers require support to train other staff members. School leaders can build time for ongoing training and coaching, consider ways to fund this, and facilitate resources.

Establishing data monitoring systems and sustaining data use over time requires support from school leaders and implementation teams. Monitoring systems might be in place but not utilised systematically by leaders to inform important decision-making. There is also a need to understand how other staff relate to data and how they perceive monitoring and its previous use in implementations. Time constraints are identified in research as barriers to use data to inform ongoing planning that school leaders can address.

Leaders must use facilitation and problem-solving strategies: those who earn trust and solve identified problems are thought to be more effective facilitators of school-level change (Robinson and Gray, 2017). Implementation leaders should facilitate enquiry into problem-solving that is non-evaluative and founded on supportive relationships with the range of actors who may identify issues with implementation (Gabby et al., 2017).

School leaders can be key for sustaining and scaling up new approaches in the long-term. Leaders focused on the future, perceiving challenges or opportunities and establishing a strong implementation climate, distributing leadership, building capacities in other staff, and recruiting high quality staff have all been shown to help support the scale-up of new approaches (Penlington et al., 2008). Conversely, research shows that a lack of organisational support or resources and a strong hierarchical culture undermined the scale-up of implementations and was associated with disempowering staff, undermining staff confidence in the approach, and less teamwork (De Brún and McAuliffe, 2020).

Implementation leaders and implementation strategies

School leaders are implementation leaders themselves, although often an implementation lead is not a member of a school leadership team. Still, it is important that the use of implementation strategies are coordinated across implementation leads. For instance, school leaders can reduce implementers' competing demands, while other implementation leaders can consider how to de-implement existing practice to support the implementation of a new approach.

Implementation leads should be engaged in planning processes in meaningful ways that foster collaboration and teamwork. Interviews suggested that often implementation planning tended to start with the school leader before becoming shared in their development.

Champions can be beneficial for generating early enthusiasm, coordinating activities, and disseminating information (Crane et al., 2021). Identifying a champion involves recognising an appropriate member of staff with enthusiasm and the relevant knowledge and skills to support and potentially lead implementation. Where champions are selected by school leaders and had decision-making power, research suggests higher fidelity than where schools had champions that were not formally appointed in this way.

Local opinion leaders are leaders in schools with formal or informal roles that can influence the attitudes and beliefs of their colleagues in relation to the implementation of new interventions (Asada et al., 2020). Often school leaders are fulfilling key actions of local opinion leaders in studies by promoting the intervention and motivating staff.

Implementation team member roles that help facilitate implementation include providing leadership, meeting regularly, learning new concepts and skills to support staff and provide professional development, providing reminders, and encouraging commitment and ownership in those delivering the intervention (Freeman et al., 2014). While an implementation team might be a group of implementation leads, research suggests that teams often have leads that

emerge over time. Some evidence also suggests that the team can be more effective when it includes a school leader (Leis et al., 2017). Where a team does include a member of senior leadership, it may be even more necessary to ensure that the team members continue to feel as though they have autonomy and influence. There is a need to recognise the hard work of the implementation team through rewarding their efforts and school leaders better acknowledging their work (Scaletta and Hughes, 2021). The benefits of developing a shared responsibility among multiple implementation leaders is needed to reduce individual workload and to build and utilise collective intelligence (Grissom et al, 2021).

Implementation leaders can model implementation behaviours so school staff involved in implementing the intervention can understand, learn, and enact those behaviours (Ryan Jackson et al., 2018). Implementation leadership can therefore involve role modelling of behaviours to support the uptake of a new intervention (Albers and Pattuwage, 2017). Seeing a leader modelling the change they are encouraging is reported to be important for encouraging buy-in. Supervision as an implementation strategy should not be regarded as an assessment. Leaders build capacity in those they supervise by continually balancing support with accountability to improve student outcomes (Ryan Jackson et al., 2018).

Implementation leaders should be able to identify indicators of fidelity (to core components) and adaptability (feasibility and relatability). This may help to support the processes of breaking down an intervention into what must be maintained and what can be adapted to the setting.

Leadership style

Leadership structures are an important context for implementation. The relative hierarchy of a school or trust's leadership can present opportunities or challenges in relation to adapting systems or structures and school leaders' involvement in implementation.

Evidence suggests that it may be beneficial to encourage different individuals to assume an active leadership role and utilise their core strengths when needed supported by a transformative or distributed leadership culture (Grissom et al., 2021). Facilitating implementation should not be the responsibility of one person but different people engaging in different kinds of leadership behaviour as needed, introducing and sustaining new interventions and responding to changes in context (Ryan Jackson et al., 2018). However, there was relatively little focus in the literature on assuming implementation leadership was best characterised as 'distributed' (increasing leadership capacity by giving leaders ownership) or 'transformative' (where school leaders inspiring and engage staff). We can see that examples of implementation strategies imply school leaders will do both, however, key is how school leaders remain agile in relation to implementation.

Changing role

Interviews with school leaders showed how a leader's role changed over time, moving from assumed responsibility to supporting other staff leading implementation. Interviews also reflected the importance of the relationship between the school leader and colleagues then leading the new approach.

Leadership qualities required for implementation may also change over time. Interviews suggested that in the early phases of implementation leaders felt a strong responsibility to model behaviour. Over time, this responsibility was shared more widely with other staff members and demonstrated trust in their understanding of implementation. With increased implementation experience and capability amongst colleagues, school leader's implementation roles have greater emphasis on empowering others.

Chapter 6. Discussion

Summary of evidence review

The evidence review consisted of four interrelated work packages as shown in Figure 1.



Figure 1: Work packages overview and relationships between them

Work Package 1 located evidence describing the application of implementation theories, models, or frameworks (TMFs) within the school-context: we located 58 TMFs that had been applied in the school context from across 82 empirical or theoretical studies. To synthesise the evidence and identify important factors in relation to implementation in schools, a system map was developed to conceptualise the factors and relationships which play a role in implementation. The [system map](#)

provides a mid-range theory (expected to be applicable across different settings) that highlights key areas of implementation in schools: foundations, intervention-related factors, and implementation processes, which can be identified as occurring at a particular stage of implementation such as during initial exploring or during preparation, delivery, monitoring, or sustainment. The system map helped to visualise how many implementation processes cut across stages or timeframes, contextual factors, the nature of the intervention, and the characteristics of individuals or groups involved.

Work Package 2 involved surveys and interviews with school leaders about their experiences of implementing approaches in their settings and the barriers and enablers they recognise. Twelve interviews were completed and a further four follow up interviews were completed. Key findings included:

- simplicity of the approach and consistency of delivery were highlighted as key;
- staff views and buy-in to an intervention, professional development, motivation, and capacity were indicated as factors relevant to fit and readiness for an approach;
- plans for implementation were often working documents and leaders' roles shifted during the implementation process;
- initial delivery of an approach was phased in some cases and sustaining an approach was supported by a range of activities; and.
- implementation that has been less successful was attributed to issues around fit of approach to setting, staff buy-in, implementation climate, quality of approach, and turnover of key staff.

Focus groups were also held with experienced users of the current EEF implementation guidance report. This revealed a lot of support for the current guidance report and resources. More guidance on selecting an intervention and use of research evidence was requested along with guidance about the use of resources. There is a perceived lack of clarity about what an implementation team ought to look like. Sharing misconceptions, mistakes, and non-examples was felt to be helpful.

Work Package 3 (WP3) identified empirical studies, or reviews of such studies, that either (a) look at the impact of factors that influence implementation in schools or education settings (drawing on the conceptualisation in WP1) or (b) seek to improve implementation in schools/education and mapped (categorised) the review evidence so that we have an overview of what exists and where the gaps are in relation to particular types of intervention, factors that influence

implementation and implementation outcomes. This includes literature that evaluates whether using specific implementation strategies improve implementation in schools. The primary goal of WP3 was therefore to locate literature of relevance for WP4. Two maps were produced, [one that mapped reviews conducted to date](#) and a [second that mapped the literature that was used in WP4's synthesis](#).

Work Package 4 was a realist review. We moved from early analysis against an initial programme theory drawn from previous work packages to develop a refined programme theory that reflected the wide evidence base to identify three broad contexts and three mechanisms that often work together in terms of a context helping a mechanism to drive implementation or intervention outcomes. We located 293 studies from a range of sources including prior work packages that helped to evidence the final programme theory. The three contexts of *enabling structures*, *intervention features*, and *agents for change* are conditions that can enable or constrain mechanisms during implementation. The mechanisms *engaging*, *reflecting*, and *uniting* are the underlying processes or social structures that can be triggered in the right context. Implementation climate is included in our model as we found evidence that implementation in schools is both influenced by previous experiences of implementation and therefore beliefs about future implementation, while any current experience of implementation provides learning to shape the beliefs and capacity that indicate implementation climate. Figure 8 shows the refined programme theory.

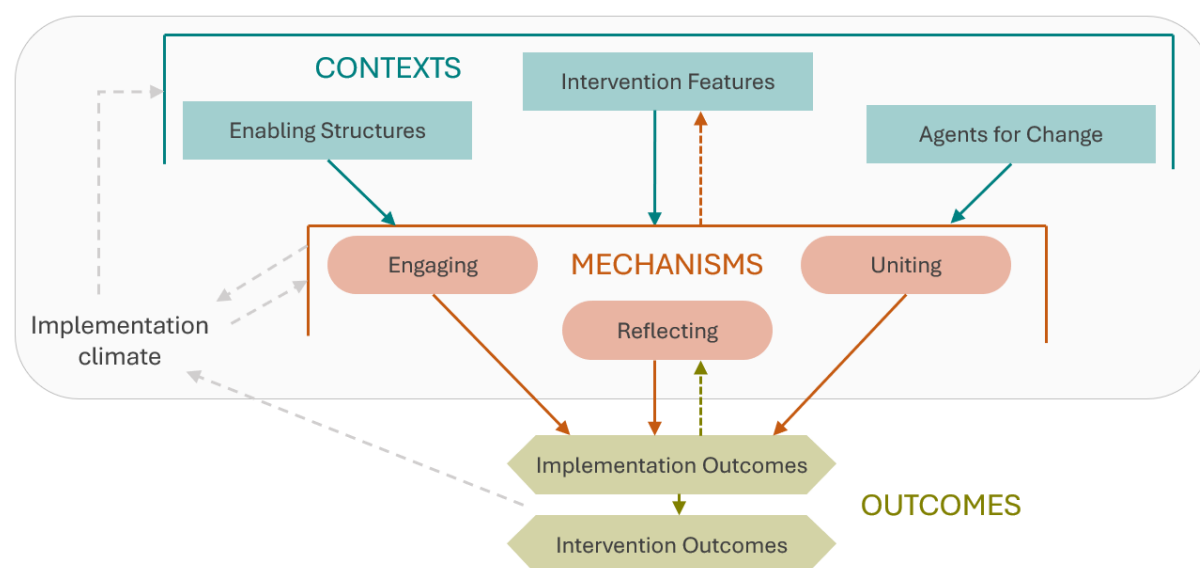


Figure 8: Refined programme theory

Solid arrows indicate evidenced direct impact between components; dotted arrows indirect feedback.

Further synthesis of implementation strategies showed application of the refined programme theory. We specified ICAMO configurations for each implementation strategy analysed (implementation strategy – context – actor – mechanism – outcome) showing the evidence that indicated how contexts, mechanisms, and outcomes from the refined programme theory were relevant to 34 strategies that had some evidence for their impact in reviews or empirical literature. Some key implementation strategies include conducting local needs assessments, planning, considering adaptability, champions, teams, professional development, ensuring implementer buy-in, and monitoring implementation.

Research questions

In this section we consider the findings from across the evidence review and in relation to particular work packages in relation to each of the two overarching research questions and the research questions relevant to each work package.

How should school leaders and teachers understand implementation and how should they implement evidence-informed approaches in their context to have the best chance of improving all pupils' outcomes?

The refined programme theory is an evidence-based model that shows several key constructs that can work together to improve implementation and pupil outcomes. The evidence review indicates how implementation in schools is complex, with the school setting interacting with the approach that is being implemented to set the parameters for the use of implementation strategies and tools. Work Package 4 shows how the refined programme theory gives direction on how to implement evidence informed approaches through the careful use of relevant contexts and mechanisms—both broadly when thinking about implementation and also when utilising specific implementation strategies. Work Package 4 also indicates the importance of implementation outcomes: they can lead to pupil outcomes and, furthermore, not ensuring outcomes like adoption of an intervention, fidelity to core components, and sustaining the new approach

over time will deny the opportunity to improve all pupil outcomes. The work packages all highlight the significance of what the approach is and how it informs implementation. Selecting an approach that fits the school setting and identified needs is a critical early step in implementation.

What is the relationship between content ('what') and process ('how') within school implementation?

Work Package 1's system map and Work Package 4's refined programme theory suggest a symbiotic relationship between what is being implemented and how this is done. While implementation strategies can be recommended and implementation can be predicted to move through loose phases, the approach amplifies the need for particular implementation strategies and often informs the availability of professional development, materials, and data collection tools. This relationship is specified in the refined programme theory in relation to the context of intervention features. While certain characteristics of interventions can be predicted to ease implementation—such as clarity, adaptability, clear outcome measures, and known barriers—ultimately the new approach itself sets a key condition for the shape of implementation. Furthermore, evidence from Work Package 4 suggests a delicate balance in relation to adapting the intervention to help with fit and feasibility. Adapting the intervention needs to respect its core components—what has been evidenced or theorised to improve pupil outcomes—whereas other changes to help facilitate the approach to be sustained in the school setting can help a range of outcomes.

How can existing implementation theories, models, and frameworks explain the interaction between school context and implementation outcomes?

Work Package 1 identified 14 TMFs that appeared across multiple studies. Together they indicate a range of implementation factors that cover aspects of implementation including processes of using research evidence to inform practice, different ecological system levels (e.g. staff characteristics, school structures, external policies, funding), different phases of implementation, psychological and social processes, implementation strategies, and barriers to implementation. Evidence of application to school implementation was seen for ten TMFs. However, compared to the volume of primary research identifying implementation factors in specific school intervention contexts located in Work Packages 3 and 4, only a minority of school implementation research uses existing TMFs as either a starting point, framework for analysis or explanation of implementation in education (79 studies and 13 TMFs used in multiple papers). Collectively, all TMFs provided a rich starting point for considering the evidence for how implementation factors relate to each other and outcomes and endorsed thinking about implementation in schools as complex adaptive systems. Yet, there was a gap for further work that brings together the range of foci indicated across the TMFs applied to schools to date and theorise the majority of school implementation research that does not draw upon existing TMFs or have a suitably broad TMF that relates well to the majority.

How should we define and conceptualise school implementation?

Work Package 1 and its system map synthesis reiterated defining and conceptualising school implementation (a) as a process that runs prior to any approach being selected to be implemented to long-term decisions about sustaining, scaling up, or de-implementing the approach and (b) in relation to both the selection and introduction of an evidence-informed approach and also as implementation itself as a complex evidence-informed practice that is well theorised and evaluated in the literature.

How do schools in England currently understand and experience implementation, and what barriers and enablers do they recognise? How does this relate to the system map derived from Work Package 1?

Work Package 2 suggested that school leaders' experience of implementation and highlighted barriers and enablers often fit with the system map from Work Package 1. Improvement needs were identified from a range of data, not just through discussion with members of the school community. Intervention features such as research evidence, fit with the school, feasibility, and resource availability were key factors in selecting an approach. Leaders reported that staff motivation was important as well as availability of funding and support from governors or trustees. Implementation planning tended to start with the school leader before becoming shared in their development. Plans for implementation were often working documents. The leaders' role was explained as changing over time, moving from responsibility to supporting champions. Data to measure outcomes was considered important, although initially this was more to indicate promise and benefit of a new approach. Experience of implementation tended to encourage staff to get more involved in future implementation. Initial delivery of an approach was phased in some cases and sustaining an approach was supported by a range of activities. Implementation that has been less successful was attributed to issues around fit of approach to setting, staff buy-in, implementation climate, quality of approach, and turnover of key staff.

How is 'Putting Evidence to Work: A School's Guide to Implementation' currently being perceived, interpreted, applied, and adapted across the sector?

Work Package 2 demonstrated—through focus groups and surveys—great support for the current guidance report and resources. There were tensions noted between messages to take time exploring and preparing for implementation and typical pressures on schools to produce results quickly. More guidance on selecting an intervention and use of research evidence could be provided. Some of the language used is complex, although it was recognised that much of the

terminology was now being used in practice and should not necessarily be simplified. There is a perceived lack of clarity about what an implementation team ought to look like. Sharing misconceptions, mistakes, and non-examples was felt to be helpful. More guidance on both the explore stage and the use of implementation strategies was requested. Users recognised a need for guidance to capture the realities of barriers to implementation and therefore capture the complexity of implementation in schools, and also feel relevant to schools in very different circumstances.

What research literature exists that investigates how different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation), and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) pupil outcomes?

Work Package 3 located 759 articles, including 57 reviews that measure or evaluate a school implementation factor, process, or strategy. The evidence maps and Work Package 4's synthesis show that the reviews and studies more often indicate impact on implementation outcomes such as fidelity, acceptability, and adoption than pupil outcomes. However, some of the literature shows the association and impact of implementation outcomes on pupil outcomes. The literature tends not to isolate particular factors or strategies in isolation to evaluate their impact alone. More often studies consider the range of factors, processes, and activities used by schools, or evaluate what distinguishes schools that have different pupil outcomes or sustain an intervention versus discontinuing.

What research literature exists that investigates the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?

Less research located during Work Package 3 tended to focus on the impact of implementation strategies. However, to more fully answer the research question below we used implementation strategies as defined by the SISTER taxonomy and through citation searching key papers related to this were able to locate more research that considers the impact of implementation strategies. Some small scale research assesses the impact of particular strategies. More often the research evaluates the use of a range of strategies as would be typical in a school implementing a new approach or for researchers supporting their intervention being used.

To what extent do different dimensions (e.g. fidelity), factors (e.g. context), processes (e.g. implementation monitoring and evaluation), and activities (e.g. implementation planning) influence (a) implementation outcomes in schools and (b) intervention outcomes?

Our refined programme theory in work packages indicates the extent to which key contexts and mechanisms impact implementation outcomes and intervention outcomes. At least 60 studies for each of *enabling structures*, *agents for change*, *intervention features*, *uniting*, *reflecting*, and *engaging* demonstrate the impact of each of these contexts or mechanisms on outcomes and each held a moderate to high confidence rating in terms of the evidence informing each component as influencing outcomes. Each of the contexts and mechanisms is broken down into a range of dimensions and factors that are in scope. Furthermore, through the analysis of implementation strategies these broad components of implementation are evidenced as informing how more specific activities can be operationalised in schools to target particular implementation outcomes.

What is the impact of implementation strategies, tools, and interventions that attempt to improve implementation of evidence-informed practice in schools?

We located evidence for 34 implementation strategies, including how they evidence implementation and/or intervention outcomes, as well as how the refined programme theory is evidenced to indicate the particular context-mechanism-outcome link that indicates how the strategy can be used effectively. Fidelity and sustainability were the most frequently evidenced implementation outcomes, each evidenced across more than half of the implementation strategies. Eleven of these implementation strategy ICAMO configurations were rated as moderate confidence in the evidence, indicating that the evidence was not always as clearcut or wide-ranging as for the refined programme theory as a whole. We categorised the implementation strategies into eight meta-strategies that give an indication of the key areas of relevant strategies and, therefore, some options of individual strategies to select or tailor.

Overall evidence statement

A wide range of literature has explored implementation in education and this is across a range of diverse interventions and school settings. Focusing on Work Package 4, the quality of the individual papers that we have included and the relevance and range of data informing the refined programme theory is good. However, although a range of studies and reviews indicate how different dimensions, factors, and processes impact implementation outcomes in schools, it is challenging to isolate a dimension like leadership, a factor like 'fit of the approach', or a process like monitoring from the range of other interacting components or specify exactly what the right kind of leadership, level of fit, or type of monitoring would be across all contexts. Equally, we found more evidence of components of implementation having some impact on implementation outcomes rather than directly upon pupil outcomes.

For the impact of implementation strategies, again, we found little evidence of isolating individual implementation strategies to measure their causal impact on implementation or pupil outcomes. Indeed, several studies and reviews report and make the argument for a combination of implementation strategies being used in school settings rather than

one being effective enough to use in isolation. Those studies that have reported on the incremental impact of using one implementation strategy, versus not, are understandably small scale. As for wider implementation factors, there is relatively little evidence that shows a direct impact on pupil outcomes. Although usefully some studies do indicate how the impact of implementation strategies on pupil outcomes is through their more direct impact on implementation outcomes, often fidelity.

Gaps in the evidence base

There are gaps for research in the early years phase. Economic outcomes were rarely evidenced. There tends to be a lack of evidence for implementation at later phases, particularly around de-implementation and scaling up an approach. There was noticeably less research about implementation strategies that directly encourage school staff such as incentives, changing policy, and increasing demand for the intervention. Research more often focuses on efforts to generate buy-in. There seems to be a gap for research about implementation strategies that focus on the early and late phases of implementation with a clear gap for an implementation strategy in the SISTER taxonomy focused on selecting the right approach.

Implications for practice

Evidence from across the work packages suggests that viewing school-based implementation as an interactive process of ongoing inquiry may be helpful. This distinguishes implementation as a process from alternative views, which might assume implementation is linear or only referring to the moment an intervention is introduced into practice. It also relates implementation of approaches with school improvement, which is illustrated by the overlap of literature across the fields. Whilst phases of implementation can act as useful guides for implementation, more emphasis on how revisiting aspects of implementation can help to mediate potential implementation dips is needed. Exploring concerns, re-assessing buy-in and readiness, updating plans, evolving implementation teams, and other aspects that may require re-visiting at various points of implementation beyond exploring and preparing stages, is critical to ensuring that voices and experiences are engaged meaningfully throughout implementation and that reflection guides decision-making.

The evidence suggests a need to consider the place of research evidence and appraisal as part of exploring interventions that might fit a school and its priorities. There may be gaps in terms of thinking about implementation when appraising whether an intervention is the right fit for the school. There are a lack of implementation strategies focused on this.

Work Package 2 survey and interview data reinforce that implementation processes are highly contextualised. What exists as a barrier to implementation in one setting can equally function as a facilitator in another. At the same time, there was agreement in participants' views and experiences across settings. WP2 results, therefore, help us to think beyond the surface level contextual similarities and differences between schools, such as their phase or size: instead, they allowed us to consider underlying conditions, processes, and relationships that impact implementation outcomes. We were able to see that schools apply implementation thinking to externally developed interventions, internally written policies, and professional development activities as well as whole-school changes to practice based on a broader shift of school ethos and philosophy.

Schools do not always agree on a definition for implementation and the approaches that they chose to report on in WP2 surveys and interviews are not always clearly showing evidence-informed decision-making. School leaders' descriptions of their data collection tends towards intervention outcomes rather than consensus building across the school community before an intervention is introduced, data to help address concerns, or a focus on collecting data to assess implementation outcomes. Therefore, further guidance ought not overlook introducing implementation as a process rather than an event and empower schools to make evidence-informed decisions about how they will implement interventions and use data to monitor this.

Implications for research

The process, as well as the outcome, of WP1 system mapping proved valuable to examining relationships, interconnections, and interdependencies between the foundations of the implementation climate, the processes of implementation, and the nature and characteristics of a given intervention. The map indicates helpful starting points for schools to think about in terms of their own implementation practice and provides areas where further resource development and support may be most helpful for those working with schools. The work around the map development presented in WP1 also provides guidance on how to use complex systems thinking to investigate generate reciprocal discourse between stakeholders and evidence from literature, and create potential pathways for further knowledge mobilisation based on indicated relationships on the map.

The WP4 refined programme theory is evidence-based. However, future research could apply the theory to either inform implementation in schools or assess how the programme theory is operationalised across differing settings and approaches.

The WP4 analysis of implementation strategies indicates how 34 strategies relate to the refined programme theory. We also categorised strategies into eight groups. Future research could apply what we have learnt about implementation

strategies to schools implementing approaches to evidence different sets of implementation strategies and explore how schools use the information that is now available to select and tailor strategies.

More research is needed that investigates how schools explore their implementation needs and select approaches. This research may evaluate guidance to support schools in this endeavour.

A range of research shows the association between implementation and intervention outcomes; further research could explore these links. It would also be valuable to provide reliable and valid tools or models for how to measure more complicated implementation outcomes and factors such as fidelity and implementation climate.

Limitations

The WP1 system map is informed by evidence from literature to show the interaction between factors that impact implementation in schools. However, it shows what is important and how it is related rather than necessarily what works to support implementation. The system map might have considered a wider range of different contextual factors and how factors relate to different implementation outcomes, but this would have added both complexity and time to the system map synthesis.

We had hoped for more survey interview responses. We were able to achieve a sample fairly representative of school demographics, however, we must consider what may have led these school leaders to participate in the research. Responses were often insightful, resonated with literature and our analysis to date, but may not be typical of school leaders across England. The data is also biased towards the views of school leaders. The results may, therefore, reflect aspects of the implementation process that are most key from their perspective and be less representative of processes deemed important by other stakeholders in the school community, such as parents, teachers, support staff, and students.

Due to time and the amount of relevant literature located, we populated the first evidence map in WP3 with reviews. We then took this work further by producing an evidence map for all included papers in WP4. This work could be furthered by mapping the 702 empirical studies located in WP3 rather than only those included in WP4.

WP4 took a broad aim for the realist review rather than focus on aspects of implementation. This held the benefit of the wide relevance of the refined programme theory but understandably made synthesising the volume of literature challenging, particularly in consolidating analytical ideas. Synthesis was organised by domain on the initial programme theory and each of these could be a focus of a review of school implementation in their own right (e.g. leadership, planning, teamwork, roles and responsibilities, and scaling up). The refined programme theory allowed a wide range of ideas from the analysis to be organised and identified broad commonalities across school implementation.

We used the literature we had already located and that cited by two key references to review implementation strategies. As we used the research that we had already located as part of previous work packages, rescreening full texts, we may have missed research focused on implementation strategies that we had not already located through our broad searches for implementation in schools literature. However, our citation analysis of two key papers ensured we found up to date and relevant literature in relation to the SISTER implementation strategies taxonomy. Focusing on the SISTER taxonomy meant a particular lens in relation to implementation strategies, however, this is the most comprehensive school-based set of implementation strategies at this time and we have indicated potential gaps in the taxonomy in implications above.

Team

Review team, with their role and responsibilities within the project and their institutional affiliation.

Darren Moore, University of Exeter (UoE): project oversight, supervise researchers, methods design and analysis across reviews; lead report writing with editing support from all.

Rachel Proctor, UoE, researcher: reviews—study selection, data extraction, quality appraisal, synthesis; primary data collection surveys and interviews; analysis with support; system map development and refinement.

Simon Benham-Clarke, UoE, researcher: reviews—study selection, data extraction, quality appraisal, synthesis; evidence map synthesis; primary data collection surveys and interviews.

Hayley Gains, UoE: reviews—study selection, data extraction, quality appraisal, synthesis; primary data collection surveys and interviews; analysis with support.

G. J. Melendez-Torres, UoE: methods design and analysis input across WPs, particularly WP3 and WP4; realist review and evidence map design.

Nick Axford, University of Plymouth: methods design and analysis input across WPs, particularly WP1 WP2; implementation science expertise.

Morwenna Rogers, UoE: information specialist; search strategy design and execution, systematic review methods.

Rob Anderson, UoE: implementation science and realist review expertise and guidance.

Dave Hall, UoE: school leadership and improvement expertise and guidance.

Jemma Hawkins, Cardiff University: implementation in schools expertise and primary research methods guidance.

Vashti Berry, UoE: survey data collection and analysis expertise and guidance; support system mapping in WP1 and WP2.

Camilla Forbes, UoE, researcher: WP1 review work and TMF synthesis.

Jenny Lloyd, UoE: interview data collection and analysis expertise and guidance.

Guidance panel

Dr Danielle D'Lima, Jon Eaton, Melanie Hooson, Jane Lewis, Prof. Daniel Muijs, Angela O'Brien OBE, and Corinne Settle, with support from Jamila Boughelaf and Jonathan Sharples.

Conflicts of interest

The work described in this evidence review was undertaken by researchers at the University of Exeter, University of Plymouth, and Cardiff University and funded by the EEF. The views expressed are those of the authors and not necessarily those of the EEF. There are no conflicts of interest to report.

Registration

Protocols for Work Packages 1 to 3 and for Work Package 4 have been published on the EEF website: <https://educationendowmentfoundation.org.uk/education-evidence/evidence-reviews/implementation-in-education>

We explored the relevance of publishing this systematic review in Campbell Collaboration Library of Systematic Reviews, but realist reviews are not typically published in Campbell Systematic Reviews to date and the Campbell Collaboration MECCIR conduct and reporting standards apply to intervention reviews.

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Appendix 1 – Search strategy WP1

Database: APA PsycInfo <1806 to July Week 2 2021>

Search Strategy:

-
- 1 exp Evidence Based Practice/ (18960)
 - 2 exp "diffusion of innovation"/ (0)
 - 3 health care reform/ or health plan implementation/ (2295)
 - 4 evidence based practice.ti,ab. (7212)
 - 5 implementation.ti. (14084)
 - 6 (implement* adj3 change).ti,ab. (2399)
 - 7 (chang* adj behavio?r).ti,ab. (1687)
 - 8 (chang* adj practi?e).ti,ab. (480)
 - 9 (introduc* adj change).ti,ab. (83)
 - 10 (knowledge adj2 translat*).ti,ab. (1381)
 - 11 (knowledge adj2 mobil*).ti,ab. (293)
 - 12 information utilisation.ti,ab. (5)
 - 13 information utilization.ti,ab. (95)
 - 14 innovation.ti,ab. (22842)
 - 15 school improvement.ti,ab. (1783)
 - 16 research informed teaching.ti,ab. (12)
 - 17 "use of research evidence".ti,ab. (99)
 - 18 research utilisation.ti,ab. (45)
 - 19 research utilization.ti,ab. (277)
 - 20 research engaged.ti,ab. (29)
 - 21 (guidelines adj2 utilisation).ti,ab. (1)
 - 22 (guidelines adj2 utilization).ti,ab. (27)
 - 23 or/1-22 (66299)
 - 24 adherence.ti,ab. (30599)
 - 25 fidelity.ti,ab. (9649)
 - 26 (acceptability or acceptance).ti,ab. (64899)
 - 27 adoption.ti,ab. (29538)
 - 28 sustainab*.ti,ab. (21816)
 - 29 feasib*.ti,ab. (38503)
 - 30 or/24-29 (181011)
 - 31 "systematic review"/ (623)
 - 32 systematic.ti. (31226)
 - 33 (systematic* adj2 review*).ab. (31423)
 - 34 systematic overview.ab. (251)
 - 35 evidence synthesis.ti,ab. (691)

36 (medline or pubmed).ab. (26278)
37 (ERIC or education research complete).ab. (2828)
38 metasynthesis.ti,ab. (295)
39 qualitative review.ti,ab. (554)
40 evidence review.ti,ab. (240)
41 scoping review.ti,ab. (2387)
42 mapping review.ti,ab. (59)
43 evidence map.ti,ab. (25)
44 realist synthesis.ti,ab. (92)
45 realist review.ti,ab. (83)
46 or/31-45 (61708)
47 Schools/ (29680)
48 school*.ti,ab. (401908)
49 pupil*.ti,ab. (27155)
50 classroom*.ti,ab. (92113)
51 teachers.ti,ab. (149953)
52 (education* adj setting*).ti,ab. (7811)
53 early years setting*.ti,ab. (155)
54 early years foundation.ti,ab. (62)
55 (nursery or nurseries).ti,ab. (4671)
56 kindergarten*.ti,ab. (18397)
57 further education.ti,ab. (1270)
58 or/47-57 (522661)
59 models, educational/ (0)
60 framework*.ti. (17716)
61 (model or models).ti. (124471)
62 taxonomy.ti. (1498)
63 (tool or tools).ti. (16893)
64 toolkit*.ti. (430)
65 guideline*.ti. (8045)
66 checklist*.ti. (2694)
67 theory.ti. (71374)
68 manual*.ti. (5851)
69 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 (243222)
70 23 and 30 and 46 and 69 (47)
71 23 and 58 and 69 (964)
72 70 or 71 (1007)

Appendix 2 – Additional searching WP1

Journals hand searched:

Advances in School Mental Health Promotion
BMC health services research
BMC public health
Implementation Science
Journal of Educational & Psychological Consultation
Journal of Educational Administration
Prevention Science
Preventive Medicine
Psychology in the Schools

Websites searched for grey literature:

Centre for Excellence and Development Impact and Learning <https://cedilprogramme.org/>
<https://evidencebased.education/>
Centre for evidence and implementation
<https://cfirguide.org/>
Grattan Institute
What Works centres, including EEF
<https://ies.ed.gov/ncee/wwc/>
<https://evidenceforlearning.org.au/>
<https://www.gov.uk/government/organisations/department-for-education>
<https://mhetcnetwork.org/centers/mhetc-network-coordinating-office/national-school-mental-health-implementation-guidance>
<https://www.oecd.org/education/implementing-policies/>
<http://www.promoteprevent.org/>
National College for School Leadership/National College for Teaching and Leadership
<https://chartered.college/publications/>
<http://implementation.fpg.unc.edu/>
<https://www.ukimplementation.org.uk>
European Implementation Collaborative <https://implementation.eu/>
Centre for Effective Services
<https://www.et-foundation.co.uk/>
<https://www.teachearlyyears.com/>

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Appendix 3 – Search strategy named TMF search WP1

Database: APA PsycInfo <1806 to October Week 1 2021>

Search Strategy:

-
- 1 4E Framework for Knowledge Dissemination.ti,ab. (0)
 - 2 Conceptual Model of Knowledge Utilization.ti,ab. (0)
 - 3 Framework for Spread.ti,ab. (3)
 - 4 "Organizational Theory of Innovation Implementation".ti,ab. (0)
 - 5 "ARC organizational and community intervention strategy".ti,ab. (1)
 - 6 "Blueprint for Dissemination".ti,ab. (0)
 - 7 "Collaborative Model for Knowledge Translation".ti,ab. (1)
 - 8 (Communities That Care and CTC).ti,ab. (77)
 - 9 (Community Development Team and CDT).ti,ab. (1)
 - 10 (Conceptual framework adj2 implementation fidelity).ti,ab. (5)
 - 11 (Conceptual Framework adj2 Research Knowledge Transfer).ti,ab. (0)
 - 12 (Diffusion adj2 Dissemination adj2 Implementation adj2 Innovations).ti,ab. (2)
 - 13 (Conceptual Model adj2 Evidence-Based Practice Implementation).ti,ab. (2)
 - 14 (Consolidated framework adj2 advancing implementation science).ti,ab. (1)
 - 15 Coordinated Implementation Model.ti,ab. (0)
 - 16 Arts Research Utilization Model.ti,ab. (0)
 - 17 Culture capital framework.ti,ab. (0)
 - 18 Effective Dissemination Strategies.ti,ab. (12)
 - 19 (Effective Practice adj2 Organisation adj2 Care Review Group adj3 taxonomy adj2 interventions).ti,ab. (0)
 - 20 (Effective Practice and "organisation of care" and EPOC and taxonomy).ti,ab. (0)
 - 21 Environmental policy framework.ti,ab. (0)
 - 22 Epicure taxonomy.ti,ab. (0)
 - 23 Expandnet.ti,ab. (3)
 - 24 ((Facilitating Adoption adj2 Best Practices adj2 Model) and FAB).ti,ab. (0)
 - 25 (Framework adj2 Dissemination adj2 Evidence-Based Policy).ti,ab. (0)
 - 26 (Framework adj2 Knowledge Translation).ti,ab. (23)
 - 27 (Framework adj2 public policy adj2 physical activity).ti,ab. (0)
 - 28 Implementation Effectiveness Model.ti,ab. (1)
 - 29 Implementation matters.ti,ab. (5)
 - 30 Implementation taxonomy.ti,ab. (0)
 - 31 Implementing Best Practices Consortium.ti,ab. (0)
 - 32 (Institutional theory and Dimaggio*).ti,ab. (17)
 - 33 ((Integrated Promoting Action adj2 Research Implementation adj2 Health Services) or i-PARiHS).ti,ab. (7)

34 ((Interacting Elements adj2 Integrating Science Policy) or TIDIRH Working Group).ti,ab. (0)

35 Knowledge Exchange Framework.ti,ab. (2)

36 (Knowledge adj2 Action Framework).ti,ab. (29)

37 (Leader* framework adj2 decision making).ti,ab. (1)

38 Linking Systems Framework.ti,ab. (0)

39 (guidelines adj2 achieve practice change).ti,ab. (0)

40 (Model adj2 Locally Based Research Transfer Development).ti,ab. (0)

41 ((Us* adj2 research) and nutley*).ti,ab. (2)

42 (Organizational readiness adj2 change).ti,ab. (90)

43 (Ottawa Model adj2 Research Us*).ti,ab. (10)

44 i-PARIHS.ti,ab. (4)

45 ((Partnerships adj2 Success) and pfs).ti,ab. (3)

46 (Pathways adj2 Evidence Informed Policy).ti,ab. (0)

47 (People adj2 places framework).ti,ab. (0)

48 Population Services International.ti,ab. (9)

49 (Practical Robust Implementation adj2 Sustainability Model).ti,ab. (9)

50 Prevention service development model.ti,ab. (0)

51 ((Promoting Action adj2 Research Implementation adj2 Health Services) or PARIHS).ti,ab. (76)

52 (Pronovost* adj 4E* adj Process Theory).ti,ab. (0)

53 (Public health adj ethical issues).ti,ab. (3)

54 Push Pull Capacity Model.ti,ab. (2)

55 Quality Enhancement Research Initiative.ti,ab. (11)

56 (Real world Dissemination and pettigrew*).ti,ab. (0)

57 Replicating Effective Programs.ti,ab. (17)

58 (Research Development Dissemination adj2 Utilization Framework).ti,ab. (0)

59 Research Knowledge Infrastructure.ti,ab. (0)

60 Intervention implementation taxonomy.ti,ab. (0)

61 Sticky Knowledge.ti,ab. (4)

62 (Streams adj2 Policy Process).ti,ab. (2)

63 ((SURE adj2 WHO) and (Implementation adj2 policy options)).ti,ab. (0)

64 (Taxonomy adj2 methods adj3 implementing change).ti,ab. (0)

65 Technical assistance model.ti,ab. (17)

66 Utilization Focused Surveillance Framework.ti,ab. (0)

67 EAST Framework.ti,ab. (1)

68 (Lippett Knoster model adj2 managing complex change).ti,ab. (0)

69 (Model adj2 Adaptation Design adj2 Impact adj framework).ti,ab. (0)

70 MADI framework.ti,ab. (0)

71 (framework adj2 reporting adaptations adj2 modifications adj2 evidence based interventions).ti,ab. (1)

72 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 (439)

73 (school* or classroom* or teacher* or pupil* or education*).ti,ab. (826062)

74 72 and 73 (113)

Appendix 4 – Included school implementation studies WP1

First Author/Date	Aim	Design	Implementation focus	School setting	Country	Participants	Intervention	Name of theory/framework/model used
Adelman 1997	Describes a "scale-up" model for replicating school reform prototypes.	Discussion	Scaling-up	States schools and stakeholders	US	No participants	"Scale-up" model	General framework
Allen 2021	Use an adapted Consolidated Framework for Implementation Research (CFIR) to understand ways that structural racism interacts with intervention implementation and uptake within an equity-oriented trial designed to enhance student-school connectedness.	Secondary analysis of qualitative implementation data	Ways that structural racism interacts with intervention implementation and uptake	10 schools	US	School stakeholders	Project TRUST	CFIR Framework adapted with an analytic approach known as Public Health Critical Race Praxis (PHCRP)
Alonge 2020	To describe the SHINE network's collaborative process for developing the pathways used at the regional and individual country levels for large-scale implementation of the SMHP.	Qualitative	Large-scale implementation	State schools	Egypt, Iran, Jordan, and Pakistan	policymakers, programme managers and mental health practitioners and academic	School-based mental health programmes	Initial implementation pathway for the SMHP in EMR
An 2022	Identify and synthesise factors that contributed to the quality and effectiveness of school diabetes care	Review	Implementation factors	All schools	International	NA	Diabetes Management	Consolidated Framework for Implementation Research (CFIR, Damschroder et al., 2009)

Austin 2011	To identify the barriers and facilitators in adopting, implementing, and maintaining a school-based physical activity intervention using RE-AIM as a theoretical evaluation framework.	Qualitative	Seems as if implementation in general	Independent and private primary school principals	Australia	School stakeholders	Physical Activity	The RE-AIM framework (Glasgow et al., 1999)
Baker 2021	An enhanced operational definition of dissemination	Discussion	Dissemination	Any school, families, and community,	Canada	None	Mental Health	Conceptual model of dissemination
Bejarano 2019	Developing and testing a tool specific to classroom-based physical activity (CBPA) programs.	Development and testing of a coding tool and methodology.	Implementation factors	Elementary schools	US	A team of experts with experience in CBPA research (the authors).	CBPA programs	CFIR
Bingham 2018	To identify challenges, disruptions, and contradictions as they occur across schools engaged in implementing technology-mediated personalised learning.	Qualitative	Implementing technology-mediated personalised learning.	8 + schools	US	Principals, teachers students and class observation	Personalised learning	Cultural historical activity theory (CHAT)
Bosworth 1999	Development and testing of a model to help schools assess their likelihood of successfully implementing health education innovations	Quantitative	Assessment of successful implementation	Tested in elementary and secondary schools	US	Experts in implementation. For survey - school administrators, direct service providers and community or	Health education innovations	Subjective Bayesian probability model

						district level administrators.		
Calvert 2020	Evaluate how CBPA programme resources addressed theory-based implementation contextual factors	Review	Intervention resources	Elementary schools	US	NA	Physical activity	Consolidated Framework for Implementation Research (CFIR, Damschroder et al., 2009)
Cane 2015	Outlines the TaMHS initiative.	Qualitative	Implementation processes	Primary secondary and special schools	UK	School stakeholders	Targeting Mental Health in Schools (TaMHS)	Second generation activity theory from Engestrom (1987, p. 78, cited by Daniels, 2001, p. 89)
Cassar 2019	Identify which implementation models are used in school-based physical activity trials, and identify factors associated with the adoption, implementation, and sustainability of school-based physical activity interventions in real-world settings.	Review	Adoption, implementation, and sustainability	All school age children (age 5-18)	International	NA	Physical activity	The Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework (Glasgow 1999, 2019)
Chambers 2020	Examined the implementation of Universal Free School Meals (UFSM)	Qualitative	Introduce or extend similar policies to UFSM	Primary schools and local authorities	UK	School stakeholders	Universal Free School Meals	Normalisation Process Theory
Charlton 2020	To identify the linkages between the implementation framework developed based on implementation science and critical incidents in the scale-up of Multi-	Discussion	General implementation with aspects of scale-up and fidelity	Not specific	US	References prior work from Charlton et al. (2018) who interviewed state-level MTSS	Multitiered System of Supports (MTSS, McIntosh & Goodman, 2016)	The implementation drivers framework, this is one of 5 frameworks included in the Active Implementation Frameworks (Fixsen et al., 2013)

	Tiered System of Supports (MTSS)					directors from 27 states		
Cook 2019	Iteratively adapt the Expert Recommendations for Implementing Change (ERIC) compilation to the educational sector.	Adaptation process	Implementation strategies	All	US	Three PhD-level experts with extensive experience conducting implementation research in schools and two of the lead researchers from the ERIC project	Any	ERIC compilation (Powell et al. 2015); School Implementation Strategies, Translating ERIC Resources (SISTER) (Cook 2019)
Corboy 2007	Evaluate process of implementation of CAMHS and Schools Together programme	Qualitative	Primary	General	Australia	69 school staff		Conceptual Model of School-Based Implementation (Greenberg et al., 2005)
Desimone 2002	Review and synthesise the literature that documents CSR implementation.	Review	Schoolwide	General	US	Stakeholders across education	CSR models	Policy attribute theory that relates five components to successful policy implementation: specificity, consistency, authority, power, and stability.
Dingfelder 2011	To explore reasons why efficacious interventions for Autism are rarely adopted, implemented, and maintained in community settings.	Discussion	Not specific	General	US	NA	Autism – related interventions	The Diffusion of Innovation Model (Rogers 1962, 2003)
Domitrovich 2008	To promote and improve research on the quality of implementation of preventive interventions in schools.	Discussion	Quality	General	US	NA	Any	Multilevel conceptual framework that organises factors that influence implementation quality into three levels: macro level,

								school level, and individual level.
Durlak 2016	Achieving quality implementation when assessing the impact of social and emotional learning interventions.	Discussion	Quality	All	US	NA	SEL	References the literature that has identified over 20 factors that can affect the process of implementation and these exist at multiple ecological levels.
Dyssegaard 2017	To examine what enables or promotes the use of evidence-based knowledge in primary and lower secondary education.	Review	Use of evidence-based knowledge	Primary and lower secondary	International	NA	Any	Active implementation framework (Metz et al., 2014), Conceptual framework of the knowledge transfer process (Ward et al., 2009) The quality implementation framework Meyers et al. (2012) Factors in implementation Humphrey et al. (2016) Six themes identified as central in the studies (authors own model)
Education Endowment Foundation (EEF) 2019	To provide information and guidance for schools	Report and guidance	General	General	UK	NA	Any	EPIS Framework (Moullin et al., 2019) The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. Chambers et al. (2013). Active implementation frameworks for successful service delivery. A Practical Implementation Science Heuristic for Organizational Readiness Scaccia et al. (2015)

Evans 2015	Explain the adoption, implementation and discontinuance of a SEL intervention	Process Evaluation	General	Secondary Schools	UK	15	Social and emotional learning	Diffusion of Innovations Theory (Rogers, 2003)
Fenton 2002	Evaluates adoption of standards and benchmarks in district secondary schools	Mixed-methods	Adoption, concerns	Middle and High Schools	US	15 schools	Standard based instruction	Concerns-Based Adoption Model (CBAM, Hall & Hord, 1987)
Flaspohler 2008	To compare the Multilevel Implementation Quality Framework with other emerging frameworks, theories, and models in health services literature	Discussion	Impediments to promoting implementation	Special education through school-family-community partnerships	US	Education, university, practitioners and parent representatives	Mental health	Interactive Systems Framework for Dissemination and Implementation. Community interventions and effective prevention
Frigge 2019	Evaluate the implementation and integration of a School Breakfast Program	Process evaluation	Scale up and expansion	High schools	US	11 principals and 12 food service directors	School meals	Normalisation Process Theory (NPT, May et al., 2010)
Fullan 2001	Offers new and seasoned leaders' insights into the dynamics of change and presents a unique and imaginative approach for navigating the intricacies of the change process	Book	Leadership and change	Schools in general	US, UK and Canada.	Discusses case examples	Any	A Framework for Leadership. Heifetz (1994)
Gabby 2017	Examined the concerns and process of change in Chemistry teachers while implementing Technology-enhanced learning environment (TELE)	Qualitative	Concerns and the change process that chemistry teachers experience while	Middle and high school	Israel	Teachers.	Chemistry teachers while implementing TELE.	Concerns-Based Adoption Model - Hall G., George A. and Rutherford W., (1977)

			implementing TELE					
Gagnier 2020	Illustrate how Knowledge Translation Framework (KTF) was used to enhance an elementary science curriculum.	Case study	Implementation of the spatial enhancements into the curriculum	Elementary - third grade	Maryland	Science teachers and pupils and district leaders and researchers.	Spatially enhancing (chemistry) curriculum	KTF builds upon planned action and translational science frameworks (Graham et al., 2006)
Gaias 2021	Describes the Adapting Strategies to Promote Implementation Reach and Equity (ASPIRE) framework.	Discussion	Reducing disparities in implementation and student outcomes	Schools in general - could involve other settings related to mental health	US	NA	Mental health and broader contexts	Three-step ASPIRE Process for Adapting Equity-Explicit Implementation Strategies. (ASPIRE), Adapting Strategies to Promote Implementation Reach and Equity.
Gale 2020	Illustrates the application of one frequently cited framework for exploring fidelity of implementation, the innovation implementation framework.	Qualitative	Fidelity	Middle school	US	Classroom observations, teacher interviews, and student interviews	Middle School engineering curriculum	Innovation implementation framework (Century and Cassata,2016; Century, Cassata, Rudnick, and Freeman,2012; Century et al.2010).
Garvis 2013	Reports on an Educational Change Model originally developed for the middle years of schooling (Pendergast et al., 2005) and applied here to an Australian early childhood education reform initiative.	Process evaluation	Initiation, Development, and Consolidation	Early childhood 'universal services sector) 37% kindergarten	Australia	Early childhood professionals	Victorian Early Years Learning and Development Framework (VEYLDF)	Educational Change Model originally developed for reform processes in Australian middle schooling (Pendergast et al., 2005; Pendergast, 2006).

Goldenthal 2021	Development and implementation of a training model (Comprehensive Implementation Training and Support—CITAS) that addresses both consultation and organisational factors known to promote the successful implementation of Tier II interventions.	Discussion and pre-test post-test surveys	Implementation quality and sustainability	Schools for pupils aged 9 through 12 years (Middle)	US	80 clinicians	Tier II intervention - Anger Coping	Comprehensive Implementation Training and Support (CITAS) model incorporated many of the training approaches outlined by Lyon et al. (2011)
Goldstein 2015	Evaluate the development and implementation of an early literacy curriculum	4 experimental studies	Process of implementation	Preschool	US	19 preschool classrooms	Early literacy curriculum for preschoolers with delays	Exploration, Preparation, Implementation, Sustainment (EPIS, Aarons et al., 2011)
Hall 2013	To introduce the three diagnostic dimensions of the Concerns Based Adoption Model (CBAM) along with illustrations of how each can be used to assess extent of implementation.	Review	Simplify complexity of implementation	Schools in general	US	No details	Any	Concerns Based Adoption Model (CBAM, Hall et al., 1973; Hall & Loucks, 1981).
Han 2005	To discuss teacher-level factors that influence program implementation and sustainability, with respect to classroom-based prevention and intervention mental health programs that are implemented by teachers.	Discussion and literature review	Sustainability	Schools in general	US	None stated	School-based MH prevention and intervention programs	Process model of sustained program implementation by teachers

Herlitz 2020	To examine what evidence exists about the sustainability of school-based public health interventions	Review	Sustainability of school-based health interventions	Schools in general	Global	NA	Health interventions	General Theory of Implementation (May 2013)
Hollingshead 2009	To describe CBAM principles and strategies that were used to increase awareness of the change process during the first year of implementing the character education program.	Survey and interviews	Broad change processes	General	US	More than 13,000 students,	Character Education Program Rachel's Challenge	Hall and Hord's (2005) concerns-based adoption model (CBAM)
Hudson 2020	Identify the determinants of early implementation success of a mindfulness intervention	Qualitative	Determinants	Secondary Schools	UK	15 school staff	Mindfulness whole school approach	Consolidated Framework for Implementation Research (CFIR. Damschroder et al., 2009)
Hung 2015	Proposes a nuanced model of educational scaling and diffusion,	Discussion/theory	Scaling-and-Diffusion	Schools in general	Singapore	Not applicable	Inquiry-based learning designs	Educational scaling-and-diffusion model for inquiry-based learning designs.
Kearns 2019	Proposes a sustainable model of implementation for increasing moderate to vigorous physical activity in public schools.	Theoretical paper	Sustainability	General - primary	US	Na	Physical Activity	Core Implementation Components (CIC theory)
Kennedy 2020	To determine the extent to which studies of school-based physical activity interventions implemented at-scale reported information across the RE-AIM dimensions.	Review	Scale-up	General	Global	NA	Physical activity	The Reach, Effectiveness, Adoption, Implementation, and Maintenance

Koh 2021	To investigate sustainable school-improvement initiatives that include explicit recognition and accommodation for schools as Complex Adaptive Systems (CAS)	Review	Sustainability	Schools in general	Global	NA	Sustainable school-improvement within CAS	Complex Adaptive Systems (CAS)
Leeman 2018	An evaluation of state, school district, and local school staffs' use of four U.S. Centers for Disease Control and Prevention (CDC) tools to support implementation of physical activity, nutrition, health education, and parent engagement.	Mixed-methods, cross-sectional design evaluation	Two types of implementation tool users—those working in support systems versus those working in delivery systems.	Staff in state departments of health and education	US	178 state staff coordinating CDC-funded school health programs.	Physical activity, nutrition, health education, and parent engagement in state, school district, and local school staff contexts	Integrates an Interactive Systems Framework (ISF) for Dissemination and Implementation Wandersman A, Duffy J, Flaspohler P, Noonan R, Lubell K, Stillman L, et al.
Leung 2020	Investigate contextual factors that could serve as facilitators or barriers to implement a system that connects students to sexual health services in two LEAs.	Qualitative using a multiple case study design	Broad	Not clear - sexual health. District staff and community based healthcare providers	US	19 staff members	School-based referral system for sexual health services	Application of CFIR Domains.
Levin 2012	Book chapter - explores knowledge mobilization (KM) in education, efforts to increase research use in policy and practice, in three	Discussion	Knowledge mobilization in education	General	Canada	NA	Any	A model of knowledge mobilization

	sections: theory, research and practice							
Lyon 2018	Examine the impact of overlapping organizational contexts by evaluating the implementation contexts of externally employed mental health clinicians working in schools.	Mixed-methods protocol	Inter-organizational alignment	Elementary, middle, and high schools	US	School Based MH clinicians and supervisors,	Contexts of externally employed mental health clinicians working in schools	Based on Exploration, Preparation, Implementation, Sustainment (EPIS) framework.
Lyon 2019	To evaluate the feasibility and importance of the SISTER strategies in schools to inform future implementation research and practice in that sector.	Evaluation	feasibility of implementation strategies	Any	US	Members of a state-sponsored initiative focused on the delivery of EBP for youth mental health concerns in schools.	Any but interest in mental health	School Implementation Strategies, Translating ERIC Resources (SISTER) (Cook 2019)
Mason-Williams 2015	Describes the Capstone Intervention Project (CIP) and how it provides an opportunity for the pre-service special education teachers (SETs) to demonstrate their routine expertise in a classroom situation, while also building adaptive expertise.	Discussion	From exploration to full implementation	Schools and stakeholders in general	US	NA	The CIP provides a dynamic, authentic method to evaluate many of the skills necessary to a SET	The Implementation Stages framework (see Fixsen, D. L., Blase, K., Metz, A., & Van Dyke,
McLoughlin 2021	describe the policy implementation outcomes and	Review	Implementation measures	General	Global	NA	Wellness, tobacco, physical	CFIR, Implementation Outcomes Framework (IOF) by Proctor and colleagues

	determinants assessed and identify the trends in measurement						activity, nutrition, obesity prevention, or mental health/ bullying/social-emotional learning	(Proctor 2009, 2011) The Policy Implementation Determinants Framework by Bullock and Lavis (Bullock HL, Lavis JN 2019).
Merrell 2006	To examine a model for education using the public health model of prevention work, combined with the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework	Discussion	General implementation	Primary, secondary, and tertiary	US	NA	Common academic, behavioural, and social emotional interventions used in schools	The RE-AIM framework, (e.g., Glasgow, 2002; Glasgow, Lichtenstein, & Marcus, 2003; Glasgow, McKay, Piette, & Reynolds, 2001; Glasgow, Vogt, & Boles, 1999)
Mills 2000	Examines the Integrated Learning System (ILS).	Discussion and evaluation	Fidelity	Elementary school	US	Teachers across 4 schools	Success maker course ware - an Integrated Learning System (ILS).	Integrated Learning System Configuration Matrix (ILSCM) Adapted from the Concerns-Based Adoption Model (Hall, G.E., Wallace, R.D., & Dossett, W.A. (1973)
Moore 2017	To present the Be a Champion! (BAC) implementation in three rural elementary schools.	Discussion including case study examples	General	Elementary schools	US	NA	Comprehensive school physical activity programs	Be a Champion incorporates the Quality Implementation Framework (QIF) (22) Meyers DC, Durlak JA, Wandersman A.)
Nathan 2018	Describe factors (barriers and facilitators) that may influence the implementation of school physical activity policies which specify the time or intensity that physical	Review	Factors that influence implementation - barriers and facilitators	General	Global	NA	Physical activity policies	The Theoretical Domain framework (TDF) (Cane et al., 2012).

	activity should be implemented and to map these factors to a theoretical framework							
Nordstrum 2017	Present methods to enhance the reach, adoption, use and maintenance of innovations in education	Process evaluation	General	Middle Schools	US	14 community-university partnership teams	Resilience	Promoting school–community–university partnerships to enhance resilience (PROSPER)
Northern Territory Department of Education 2020	Assist staff in the development of a process for the thoughtful deimplementation of initiatives identified as requiring revision or retirement	Guidance	Deimplementation	Schools in general	Australia	None	Any	The Evidence Framework – The Stages of Deimplementation (Evidence for Learning).
Odom 2014	Describe a set of implementation science principles and practices that could be employed in supporting the adoption and implementation of a comprehensive program for high school students with ASD.	Discussion	General	High Schools	US	Adolescents and young adults with autism spectrum disorder (ASD)	Programs for Students with Autism Spectrum Disorder	Strategies for Implementing Complex Social Interventions in Schools
Olstad 2015	To understand the processes underlying adoption and diffusion of Canadian school-based daily PA (DPA) policies, and to review evidence regarding their implementation and impact	Review	Adoption/diffusion	General	Canada	NA	Physical activity policies	Diffusion of Innovations theory (Rogers 2003)

Redding 2017	A framework to conceptualize implementation when design, implementation, and scaling up are integrated activities	Discussion	Scaling-up	Schools in general	US	NA	Educational reforms	New framework (https://my.vanderbilt.edu/sca lingupcenter/) Draws from implementation Quality Implementation Framework (QIF) Meyers et al. (2012), Coburn's (2003) scale-up framework,
Reezigt 2005	Presents the comprehensive framework for effective school improvement as it was developed in the ESI Project (Reezigt, 2001)	Developme nt of the framework	A framework within which effective school improvement can be developed or explained	Just schools	Netherland s	None	Any	Comprehensive framework for effective school improvement - the main innovation that the framework offers is the combination of earlier concepts from the often separated fields of school effectiveness and school improvement.
Rickinson 2020	Introduce and critique a model for assessing and facilitating the implementation process in schools	Discussion	Use of research evidence	Schools in general	Australia	NA	Project partners and stakeholders	Quality Use of Research Evidence Framework
Roach 2009	To introduce and critique one model for assessing and facilitating the implementation process and to identify possible "impact points" for consultation researchers and practitioners.	Discussion	General	Schools in general	US	NA	School-based consultations interested in identifying impact points for facilitating implementation of research-based practices and programs in classrooms and schools	Concerns-Based Adoption Model (CBAM) see Hall, G. E., & Hord, S. M. (2006).

Ryan Jackson 2018	To describe how to use the Four Domains for Rapid School Improvement	Discussion	Scale up	Any	US	NA	Any	The Four Domains for Rapid School Improvement: A Systems Framework.(The Center on School Turnaround (2017)
Sarama 2013	To describe a model of scale-up at the school district level and its initial evaluation.	Discussion	Scale-up	Early years	US	NA	Focused on early childhood mathematics.	TRIAD scale-up model (Technology-enhanced, Research-based, Instruction, Assessment, and professional Development) (Sarma 2013)
Sharma 2005	A brief review of the concept of innovation and research which relate to the adoption and implementation of innovations in organisations.	Qualitative	Case studies	Across four schools in different regions	India	Teachers	Innovative practice	Framework for Initiating, Sustaining and Managing Innovations in Schools
Sims 2017	To help educators and mental health professionals become familiar with five overarching frameworks: Active Implementation Framework.	Discussion	Process of implementation	Schools in rural settings	US	NA	Mental health in schools	Active Implementation Framework
Splett 2011	Describes how a new framework that dually promotes best practices and best practice processes should be considered in community centred processes of implementation.	Discussion	Adopting using community-centred (CC) processes	General	US	NA	Mental health	Getting to Outcomes (GTO) framework (Wandersman, Imm, Chinman, & Kaftarian, 1999, 2000)

State Implementat ion and Scaling-up of Evidence-based Practices 2021	How professional learning and educator supports are planned and executed.	Discussion	Competency Drivers and Sustainability	Elementary and Secondary School	US	None	Professional learning	Implementation Drivers
Sun 2007	The contextual influence on effective school improvement (ESI)	Review	None	Schools in general	Belgium, Finland, Netherlands, UK Greece, Italy, Portugal, and Spain	Researcher, school staff and international student workshops, national conference feedback, and interviews	Any	“goal – pressure – support” conceptual framework accompanied by 10 contextual factors and 48 indicators
Trapani 2018	The Concerns Based Adoption Model (CBAM) is the instrument used in this case study to evaluate the efficacy of the Understanding by Design (UbD) instructional framework implementation plan.	Case study	Evaluate the implementation process	One high school	US	53 teachers	Implementing the UbD constructivist instructional framework'	CBAM (Hall & Hord, 1987, 2006)
Tunks 2009	Examine changes in teachers' behaviour after participation in a maths instruction programme	Case study	Teacher concerns and behaviour change	Elementary schools	US	10 teachers and support staff	Algebraic thinking	Concerns based adoption model (CBAM, Hall & Hord, 2001)
van Geel 2017	Explore which school characteristics at the start and throughout a data-based decision	Review and survey	Data-based decision making (DBDM)	General	Netherlands	School stakeholders	School DBDM	Cycle of Data-based decision making (DBDM) (authors own)

	making (DBDM) intervention facilitate or hinder its implementation.							
Viennet, 2017	An in-depth analysis of the concept of education policy implementation, its definitions, processes and determinants and proposes a framework for analysis and action.	Literature review/discussion	Policy	Any	UK	The literature selected was peer-reviewed or referenced by authorities in the field.	Education policy implementation	Education policy implementation: A visual framework (OECD 2017)
Waller 2017	To develop an understanding of the factors affecting the implementation of tobacco and substance use intervention programmes in the secondary school setting using Normalisation Process Theory (NPT as an analytical framework	Review	General	General	Global	NA	Tobacco and substance use interventions	NPT (May 2009, 2001, 2015)
Weatherson 2017	Understand teachers' barriers and facilitators to the implementation of Daily Physical Activity policy in British Columbia elementary schools	Process evaluation	Barriers and facilitators	Elementary	Canada	13 teachers	Physical activity	Theoretical Domains Framework (Cane et al., 2012)
Weston 2009	To present and assess a conceptual framework and methodology used by schools for engaging with change and determining the scope of	Discussion	New framework	All (pre-kindergarten - grade 12)	US	4 schools	Any	Engaging with change: a model for adopting and evaluating school-based innovation (Weston and Bain, 2008)

	change implementation.							
Wicks 2019	Presents the Effective Implementation Framework	Discussion	New framework	All schools	US	NA	Any	The Effective Implementation Framework (Wicks et al., 2019) (George W. Bush Institute)
Wood 2017	Examining barriers which constrain sustainable organizational change in schools and universities.	Discussion	Organizational change in schools/universities	School/university (no age range provided)	UK	NA	NA	Normalization Process Theory (NPT)
Yates 2001	An overview of diffusion theory and its application to instructional technology provides a framework from which to examine how diffusion theory can be applied to media literacy programs	Discussion	NA	NA	US	NA	Media literacy programs	Instructional technology diffusion theory (Surry and Farquhar 1997) Diffusion of Innovations (Rogers, 1995)}

Appendix 5 – Included Reviews WP1

Study	Aim of Review	Type of implementation reviewed	Setting	Type of review	Framework focus	Name or list of frameworks
Albers 2017	To identify studies employing an implementation framework in this field; to ascertain the ways in which implementation frameworks are being tested.	Implementation frameworks	Child, youth and family services	Scoping review	Multiple	AIF - Active Implementation Frameworks (Metz & Bartley, 2012), ARC Organizational and Community Intervention Model (Glisson & Schoenwald, 2005), CTD – The Community Development Team (Saldana & Chamberlain, 2012; Sosna & Marsenich, 2006), The Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009), EPIS (Exploration Preparation Implementation and Sustainment) implementation conceptual model (Aarons et al., 2010, 2012; Hurlburt et al., 2014), Getting To Outcomes (GTO), Integrated Systems Framework (ISF) (Flaspohler et al., 2008; Wandersman, Duffy, et al., 2008), The Practical, Robust Implementation and Sustainability Model (PRISM) (Feldstein & Glasgow, 2008)
Albers 2021	Examine which strategies have been reported as being used by implementation support practitioners and how these strategies were	Specific means or methods for adopting and sustaining research-supported interventions.	Broad	Systematic integrative review	One	Expert Recommendations for Implementing Change

	applied in concrete practice settings.					
Barker 2016	Describe a scale-up framework for taking complex health interventions to full scale. Identified other scale-up approaches for comparison.	Scaling up	Broad	Review of systematic reviews	Multiple	Implementing Best Practices Consortium, Expandnet, WHO/Massoud, Management Systems International, Consolidated Framework for Implementation Research, Yamey, The Framework for Going to Full Scale (authors own)
Bergstrom 2020	Enhance the understanding of the breadth and depth of the use of The Promoting Action on Research Implementation in Health Services (PARIHS) framework.	Evaluation of PARIHS framework	Broad (mainly clinical/primary)	Citation analysis (the examination of the frequency and patterns of citations in scientific articles)	One	The Promoting Action on Research Implementation in Health Services (PARIHS) framework
Carroll 2007	A critical review of existing conceptualisations of implementation fidelity and developed a new conceptual framework for understanding and measuring the process.	Fidelity	Broad	Multi-method search including a systematic review	Multiple	A conceptual framework for implementation fidelity
Clinton-McHarg 2016	To identify measures of implementation constructs which have been	Psychometric properties of implementation measures	Broad - public health and community settings	Systematic review	One	Consolidated Framework for Implementation Research (CFIR) framework.

	developed in community settings; describe how the domains of each measure align with the five domains and 37 constructs of the Consolidated Framework for Implementation Research (CFIR) framework.					
Damschroder 2009	To establish the Consolidated Framework for Implementation Research (CFIR) that comprises common constructs from published implementation theories.	Intervention characteristic, outer setting, inner setting, characteristics of the individuals involved, and the process of implementation.	Broad - health services	Snowball sampling approach to review	Multiple	Conceptual Model for Considering the Determinants of Diffusion, Dissemination, and Implementation of Innovations in Health Service Delivery and Organization (Greenhalgh 2004), Conceptual Model for Implementation Effectiveness (Klein, 1996/2001), Dimensions of Strategic Change (Pettigrew A 1992), Theory-based Taxonomy for Implementation (Leeman 2007), PARIHS Framework: Promoting Action on Research Implementation in Health Services (Kitson 1997), (Rycroft-Malone 2002), Ottawa Model of Research Use (Graham 2004), Conceptual Framework for Transferring Research to Practice (Simpson 2002 & 2007), Diagnostic/Needs Assessment (Kochevar 2006), Stetler Model of Research Utilization (Stetler 2001), Technology Implementation Process Model

						(Edmondson 2001), Replicating Effective Programs Framework (Kilbourne 2007), Organizational Transformation Model (VanDeusen Lukas 2007), Implementation of Change: A Model (Grol 2007 & 2005), Framework of Dissemination in Health Services Intervention Research (Mende 2008), Conceptual Framework for Implementation of Defined Practices and Programs (Fixsen 2005), Will it Work Here? A Decision-maker's Guide Adopting Innovations (Brach 2008), Availability, Responsiveness and Continuity: An Organizational and Community Intervention Model (Glisson 2005&2008), A Practical, Robust Implementation and Sustainability Model (PRISM) (Feldstein 2008), Multi-level Conceptual Framework of Organizational Innovation Adoption (Frambach 2001)
Davis 2015	To identify theories of behaviour and behaviour change of potential relevance to public health interventions across four scientific disciplines: psychology, sociology, anthropology and economics	Context and social, cultural and economic factors	Broad	Scoping Review	Multiple	An Action Model of Consumption, Affective Events Theory, AIDS Risk Reduction Model, Attitude-Social Influence – Efficacy Model and its successor I – Change, Behavioural Ecological Model of AIDS, Prevention, Change Theory, Classical Conditioning, COM-B Model, Consumption of Social Practices, Containment Theory, Control Theory, Diffusion of Innovations, Differential Association Theory, Ecological Model of Diabetes Prevention, Extended

						Information Processing Model, Extended Parallel Process Model, Feedback Intervention Theory, General Theory of Crime, General Theory of Deviant Behaviour, Goal Directed Theory, Goal Framing Theory, Goal Setting Theory, Health Action Process Approach, Health Behaviour Goal Model, Health Behaviour Internalisation Model, Health Belief Model, Health Promotion Model, Information- Motivation-Behavioural (IMB) Skills Model, IMB Model of ART Adherence (extension of IMB), Integrative factors influencing smoking behaviour model, Integrative model of health and attitude behaviour change, Integrating the factors influencing smoking behaviour and the model of attitude and behaviour change, Integrative Model of Behavioural Prediction, Integrated Theory of Drinking and Behaviour, Integrated Theoretical Model for Alcohol and Drug Prevention, Integrative Theory of Health Behaviour Change, Model of Pro-environmental Behaviour, Motivation Opportunity Abilities Model, Needs Opportunities Abilities (NOAA) Model, Norm Activation Theory, Operant Learning Theory, Precaution Adoption Process Model, Pressure System Model, PRIME Theory, Problem Behaviour Theory, Prospect Theory, Protection Motivation Theory, Prototype Willingness Model, Rational
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						Addiction Model, Reflective Impulsive Model/Dual Process Theory, Regulatory Fit Theory, Relapse Prevention Theory, Risks as Feelings Model, Self-determination Theory, Self-efficacy Theory, Self-regulation Theory, Six Staged Model of Communication Effects, Social Action Theory, Social Action Theory, Social Change Theory, Social Cognitive Theory, Social Consensus Model of Health Education, Social Development Model, Social Identity Theory, Social Influence Model of Virtual Community Participation, Social Ecological Model of Walking, Social Ecological Model of Behaviour Change, Social Learning Theory, Social Norms Theory, Systems Model of Health Behaviour Change, Technology Acceptance Models 1, 2 and 3, Temporal Self-regulation Theory, Terror Management Health Model, Terror Management Theory, Theory of Normative Conduct, Theory of Interpersonal Behaviour, Theory of Normative Social Behaviour, Theory of Planned Behaviour/Reasoned Action, Theory of Triadic Influence, Transcontextual Model of Motivation, Transtheoretical/Stages of Change Model, Value Belief Norm Theory.
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Dryden-Palmer 2020	To advance understanding of implementation components that support the complete and timely integration of new knowledge.	The relationships between, context, complexity and implementation process	Hospitals	Realist review	Suggests one, reviews multiple	Tunnel model of Implementation Context, Complexity and Process. Theoretical, phased, and cyclic models, Rogers theory of diffusion, Knowledge to Action framework, PARIHS model, Diffusion of innovations (linear), Evidence-based medicine model (cyclic), Social interactional models, The knowledge utilization process (multi-directional as well as multiple level process) Ward et al. 2009, Review of knowledge translation theory.
Esmail 2020	To identify and describe available full-spectrum knowledge translation (KT) theories, models, and frameworks (TMFs) to subsequently guide users	Knowledge translation	Clinical care	Scoping Review	Multiple	Process models (n = 18): CAN-IMPLEMENT (Canadian Guideline Adoption Study Group), Co-KT Framework, Collaboration Framework, Collaborative Model for Achieving Breakthrough Improvement, Community-based knowledge translation framework, Designed Focused Implementation Model, A Staged Model of Innovation Development and Diffusion of Health Promotion Programs, Stages of Research and Evaluation, Healthcare Improvement Collaborative Model (HICM), Knowledge-to-Action (KTA), KT Framework for AHRQ Patient Safety Portfolio and Grantees, LEAN Transformation Process, Model for Accelerating Improvement, National Center on Health, Physical Activity and Disability Knowledge, Adaptation, Translation and Scaleup (N-KTAS) framework, Plan-Do-Study-Action (PDSA) Cycle, Quality

						<p>Implementation Framework, The Translational Model of the Black Dog Institute, Western Australia (WA) Health Network Policy Development and Implementation Cycle, Classic theories (n = 8): Diffusion of Innovations, Interorganizational Relations Theory, Precaution Adoption Process Model (PAPM), Self-Regulation Theory, Social Cognitive Theory (SCT), Social Ecology Model for Health Promotion, Social Learning Theory, Transtheoretical Model of Behaviour Change, Determinant Frameworks (n = 3): Consolidated Framework for Implementation Research (CFIR), Social Marketing Framework, Knowledge Integration Process, Evaluation frameworks (n = 3): A Conceptual Framework for Planning and Improving Evidence-Based Practices, PRECEDE-PROCEED, RE-AIM, Process and Classic Theory (n = 1): Stage Theory of Organizational Change, Classic Theory and Determinant Framework (n = 2): Community Connection Model, Community to Community Mentoring Model (CCM), Process Model and Evaluation Framework (n = 1): Evidence-Driven Community Health Improvement Process (EDCHIP)</p>
Field 2014	If and how the KTA framework is being used in practice	Translating the best available evidence into actual health interventions in a	Clinical practice	Citation analysis and systematic review	One	The Knowledge to Action Framework ('the KTA Framework') Graham et al 2006

		timely way to provide the most effective care and service				
Greenhalgh 2004	Summarizes the findings of the diffusion of service innovations model in practice	Determinants of Diffusion, Dissemination, and Implementation of Innovations	Healthcare	Systematic - meta-narrative review	One	Diffusion of Innovations (Greenhalgh 2004)
Langer 2016	To review the evidence-base relevant to increasing the use of research evidence by decision-makers	Evidence-informed decision-making	Broad	Systematic Review	One	A conceptual framework for evidence informed decision making is presented in Figure 1.1., an intervention logic model is presented in Figure 1.3.
Leeman 2019	To draw on organizational theory to expand on Consolidated Framework for Implementation Research (CFIR).	Outer setting determinants	Broad	Scoping Review	Multiple	Institutional theory (DiMaggio and Powell, 1983), Contingency theory (Lawrence and Lorsch, 1967), Transaction cost economics (Shelanski and Klein, 1995)

Leeman 2017	To advance theory to guide the design of capacity building strategies and how these might be adapted to context.	Capacity building	Broad -public health and other community-based practitioners	Scoping review	Multiple	'Integration of targeted health interventions into health systems: A conceptual framework for analysis' Atun et al (2010), 'Theory based model of translation practices in public health participatory research'. Clavier et al (2012), 'A consolidated framework for advancing implementation science'. Damschroder et al. (2009), Explaining diffusion patterns for complex health care innovations Denis, et al (2002), Contextual factors influencing readiness for dissemination of obesity prevention programs and policies Dreisinger et al. (2012), Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation' Durlak and DuPre (2008), Sticky knowledge Elwyn, et al (2007), Implementation research: A synthesis of the literature. Fixsen, Naoom, Blase, Friedman, and Wallace (2005), Diffusion of innovations in service organizations Greenhalgh et al (2004), PARIHS framework: Theoretical and practical challenges. Kitson et al. (2008), Rycroft-Malone (2004), A technical assistance model for guiding service and systems change.' Le, Anthony et al (2014), A theory-based taxonomy of methods for implementing change in practice'. Leeman, Baernholdt, and Sandelowski (2007), Normalization process theory:
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						<p>Development of a simplified approach and web-enabled toolkit' May et al. (2009), Development of a theory of implementation and integration: Normalization process theory May et al. (2011), A framework for building evidence on dissemination and implementation in health services research Mendel, et al (2008)a, Diffusion of Innovations Rogers (2003), A leader's framework for decision making.' Snowden and Boone (2007), The interactive systems framework for dissemination and implementation Wandersman et al. (2008), A theory of organizational readiness for change Weiner (2009), Blueprint for the dissemination of evidence-based practices in health care Yuan et al. (2010)</p>
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McGoey 2017	To evaluate the internal and external validity of randomised and non-randomised interventions	Factors that inform generalizability across settings and populations	Physical health in school-based, community, family, and primary care clinic	Systematic Review	One	Reach, Efficacy/Effectiveness, Adoption, Implementation and Maintenance framework (RE-AIM)
Meyers 2012	To provide a conceptual overview of the implementation process. Also, to develop a new implementation meta-framework.	Critical steps in the implementation process. Complex and dynamic nature of implementation.	Broad	Literature synthesis	Multiple	Collaborative for Academic, Social, and Emotional Learning, National Center for Mental Health Promotion and Youth Violence Prevention. (2011), Getting To Outcomes Chinman et al. (2004), Consolidated Framework for Implementation Research Damschroder et al. (2009), Practical, Robust Implementation and Sustainability Model Feldstein and Glasgow (2008), Availability, Responsiveness, Continuity community intervention model Glisson and Schoenwald (2005), Diffusion of innovations in service organizations Greenhalgh et al. (2004), Communities That Care Hawkins et al. (2002), Blueprints Mihalicet al. (2004), Replicating Effective Programs Kilbourne et al. (2007), A framework to implement strategies in organizations. Okumus (2003), Diffusion of innovations (5th ed.). Rogers (2003), Promoting Action on Research Implementation in Health Services Rycroft-Malone (2004), Promoting School/Community-University Partnerships to Enhance Resilience (PROSPER) Spoth and Greenberg (2005), 'Developing effective

						prevention services for the real world: A prevention service development model' Sandler et al. (2005), Quality Enhancement Research Initiative (QUERI) Stetler et al. (2008), Interactive Systems Framework (ISF) Wandersman et al. (2008)
Michie 2011	To construct a framework of behaviour change interventions that meets usefulness criteria. To establish the reliability with which the new framework can be used.	Behaviour change	Broad	Systematic review and consultation with behaviour change experts	Multiple	Epicure taxonomy West (2006), Culture capital framework, Knott et al. (2008), EPOC taxonomy of interventions, Cochrane Effective Practice and Organisation of Care Review Group (EPOC) (2010), RURU: Intervention implementation taxonomy Walter et al. (2003), MINDSPACE [28], Institute for Government and Cabinet Office (2010), Taxonomy of behaviour change techniques [29] Abraham et al. (2010), Intervention mapping Bartholomew et al. (2011), People and places framework [31], Maibach et al. (2007), Public health: ethical issues Nuffield Council on Bioethics (2007), Injury control framework Geller et al. (1990), Implementation taxonomy Leeman et al. (2007), Legal framework [35] Perdue et al. (2005), ETeR White (in prep.) DEFRA's 4E model DEFRA (2008), STD/ HIV framework Cohen and Scribner (2000), Framework on public policy in physical activity Dunton et al. (2010), Intervention framework for retail pharmacies Goel et al. (1996), Environmental policy framework Vlek (2000), Population

						Services International (PSI) framework PSI (2004)
Moullin 2019	Examines and describes the research application of a widely used implementation framework.	Implementation process	Broad -health and social care	Systematic review	One	Exploration, Preparation, Implementation, Sustainment (EPIS) framework (Aarons 2011)
Nilsen 2019	To investigate and map how determinant frameworks used in implementation science were developed, what terms are used for contextual	Contextual determinants	Health care	Scoping review	Multiple	PARIHS: Kitson et al., 1998, Rycroft-Malone, 2010; i-PARIHS: Harvey and Kitson, 2016, Cabana et al., 1999 Physicians' adherence to clinical practice guidelines, Mäkelä and Thorsen, 1999 Implementation of guidelines to achieve practice change Grol and Wensing, 2004, Achieving evidence-

	determinants, how context is conceptualized.					<p>based practice, Fleuren et al., 2004 Implementation of innovations in health care organizations, Greenhalgh et al., 2005 Diffusion, dissemination and sustainability of innovations and delivery of health services TDF: Michie et al., 2005; Cane et al., 2012, Behaviour change, Wensing et al., 2005 Behaviour change, AIF: Fixsen et al., 2005; Blase et al., 2012 Implementation of evidence-based intervention NICS, 2006, Change in clinical practice Cochrane et al., 2007., Optimal care, in terms of implementation of guidelines, evidence and research into practice Nutley et al., 2007. Use of research, PRISM: Feldstein and Glasgow (2008) Adoption, implementation and sustainability of health care interventions and programs, CFIR: Damschroder et al., 2009. Influences on implementation (outcomes) Gurses et al., 2010, Compliance with evidence-based guidelines, SURE: WHO, 2011 Implementation of policy options, TICD: Flottorp et al., 2013 Improvements in health care professional practice.</p>
Nilsen 2015	To propose a taxonomy that distinguishes between different categories of theories, models and frameworks	Determinants of implementation success	Broad	Narrative review	Multiple	<p>Process models: Model by Huberman, model by Landry et al., model by Davies et al., model by Majdzadeh et al., the CIHR Model of Knowledge Translation, the K2A Framework, the Stetler Model, the ACE Star Model of Knowledge Transformation, the Knowledge-to-</p>

						<p>Action Model, the Iowa Model, the Ottawa Model, model by Grol and Wensing, model by Pronovost et al., the Quality Implementation Framework Determinant frameworks: PARIHS, Active Implementation Frameworks, Understanding-User-Context Framework, Conceptual Model, framework by Grol et al., framework by Cochrane et al., framework by Nutley et al., Ecological Framework by Durlak and DuPre, CFIR, framework by Gurses et al, framework by Ferlie and Shortell, Theoretical Domains Framework Classic theories: Theory of Diffusion, social cognitive theories, theories concerning cognitive processes and decision making, social networks theories, social capital theories, communities of practice, professional theories, organizational theories Implementation theories: Implementation Climate , Absorptive Capacity, Organizational Readiness, COM-B, Normalization Process Theory Evaluation frameworks: RE-AIM; PRECEDE-PROCEED; framework by Proctor et al.</p>
Novins 2013	To identify key findings from empirical studies examining the dissemination and	Phases and inner/outer factors of implementation	Child and adolescent mental health.	Systematic review	One	EPIS model (Aarons et al, 2011)

	implementation of evidence-based practices					
Sanchez-Flack 2020	To determine the availability of data on both internal and external validity across dimensions of RE-AIM framework	Reach, Efficacy/Effectiveness, Adoption, Implementation, and Maintenance	Obesity prevention and interventions in early childcare and education	Systematic review	One	The RE-AIM framework

Skolarus 2017	To determine the role of frameworks in the development of dissemination and implementation research	Research-to-practice activities at different socio-ecologic levels within the health care system	Health care	Citation network analysis following a literature review	Multiple	Knowledge to Action Framework, Conceptual Model for the Diffusion of Innovations, Sticky Knowledge, Theoretical Domains Framework, The RE-AIM Framework, Consolidated Framework for Implementation Research, Conceptual Model of Evidence-Based Practice Implementation in Public Service Sectors, Conceptual Model of Implementation Research, Implementation Effectiveness Model, Promoting Action on Research Implementation in Health Services, Research Knowledge Infrastructure, Interactive Systems Framework, Utilization-Focused Surveillance Framework, Normalization Process Theory, Multi-level Conceptual Framework of Organizational Innovation Adoption, PRECEED Model, 4E's Process Theory, Knowledge Exchange Framework, Framework of Dissemination in Health Services Intervention Research, A Framework for Analysing Adoption of Complex Health Innovations, Pathways to Evidence Informed Policy, Availability Responsiveness & Continuity (ARC), Practical, Robust Implementation and Sustainability Model (PRISM), An Organizational Theory of Innovation Implementation, Ottawa Model of Research Use, Policy Framework for Increasing Diffusion of Evidence-Based Physical Activity Interventions, Replicating Effective
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						<p>Programs Plus Framework, Framework for Knowledge Translation, Collaborative Model for Knowledge Translation Between Research and Practice Settings, A Convergent Diffusion and Social Marketing Approach for Dissemination, Framework for the Dissemination & Utilization of Research for Health-Care Policy & Practice, Critical Realism & the Arts Research Utilization Model (CRARUM), Coordinated Implementation Mode, Knowledge Translation Model of Tehran University of Medical Sciences, Dissemination of Evidence-based Interventions to Prevent Obesity, OPTIONS Model, Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative, Conceptual Framework for Research Knowledge Transfer and Utilization, "4E" Framework for Knowledge Dissemination and Utilization, Linking Systems Framework, Blueprint for Dissemination, Health Promotion Research Center Framework, A Framework for Spread, Model for Locally Based Research Transfer Development , A Six-Step Framework For International Physical Activity Dissemination, CDC DHAP's Research-to-Practice Framework, Health Promotion Technology Transfer Process, RAND Model of Persuasive Communication and</p>
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						<p>Diffusion of Communication and Medical Innovation, A Conceptual Model of Knowledge Utilization, Model for Improving the Dissemination of Nursing Research, Effective Dissemination Strategies, Diffusion of Innovation, Streams of Policy Process, Active Implementation Framework, The Precede–Proceed Model, Research Development Dissemination and Utilization Framework, Real-World Dissemination, A Framework for the Transfer of Patient Safety Research into Practice, Framework for Dissemination of Evidence-Based Policy, Marketing and Distribution System for Public Health, Facilitating Adoption of Best Practices (FAB) Model, Interacting Elements of Integrating Science, Policy, and Practice TIDIRH Working Group. 2011.</p>
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Stirman 2019	To develop a refined FRAME framework that expanded the original framework to facilitate documentation of additional aspects of the implementation process	Adaptation	Broad	Systematic review	One	Updated Framework for Reporting Adaptations and Modifications-Enhanced (FRAME)
Tabak 2012	To organise and synthesise models, theories and frameworks by developing an inventory of models used in dissemination and implementation research	Dissemination and implementation, how to select a model to inform study design and execution	Broad	Narrative review, snowball sampling	Multiple	Diffusion of Innovation, RAND Model of Persuasive Communication and Diffusion of Medical Innovation , Effective Dissemination Strategies, Model for Locally Based Research Transfer Development, Streams of Policy Process, A Conceptual Model of Knowledge Utilization, Conceptual Framework for Research Knowledge Transfer and Utilization, Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative Policy, Framework for Increasing Diffusion of Evidence-based Physical Activity Interventions, Blueprint for Dissemination, Framework for Knowledge Translation, A Framework for Analysing Adoption of Complex Health Innovations, A Framework for Spread Collaborative, Model for Knowledge Translation Between Research and Practice, Settings Coordinated Implementation Model, Model for Improving the Dissemination of Nursing, Research Framework for the Dissemination &

						<p>Utilization of Research for Health-Care Policy & Practice Framework of Dissemination in Health Services, Intervention Research Linking Systems Framework, Marketing and Distribution System for Public Health, OPTIONS Model, A Conceptual Model for the Diffusion of Innovations in Service Organizations Health Promotion Research, Center Framework Knowledge Exchange Framework, Research Knowledge Infrastructure, A Convergent Diffusion and Social Marketing Approach for Dissemination, Framework for Dissemination of Evidence-Based Policy, Health Promotion Technology Transfer Process, Real-World Dissemination, A Framework for the Transfer of Patient Safety Research into Practice, Interacting Elements of Integrating Science, Policy, and Practice, Interactive Systems Framework, Push-Pull Capacity Model, Research Development Dissemination and Utilization Framework, Utilization-Focused Surveillance Framework, "4E" Framework for Knowledge Dissemination and Utilization, Critical Realism & the Arts Research Utilization Model (CRARUM), Davis' Pathman-PROCEED Model, Dissemination of Evidence-based Interventions to Prevent Obesity, Knowledge Translation Model of Tehran University of Medical Sciences, Multi-level Conceptual</p>
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						<p>Framework of Organizational Innovation Adoption, Ottawa Model of Research Use, The RE-AIM Framework, The Precede-Proceed Model, Facilitating Adoption of Best Practices (FAB) Model, A Six-Step Framework For International Physical Activity Dissemination, Pathways to Evidence Informed Policy, CDC DHAP's Research-to-Practice Framework, Practical, Robust Implementation and Sustainability Model (PRISM), Active Implementation Framework, An Organizational Theory of Innovation Implementation, Conceptual Model of Implementation, Research Implementation Effectiveness Model, Normalization Process Theory, Promoting Action on Research, Implementation in Health Services, (PARIHS), Pronovost's 4E's Process Theory, Sticky Knowledge, Consolidated Framework for, Implementation Research, Replicating Effective Programs Plus Framework, Availability, Responsiveness, Continuity (ARC): An Organizational & Community Intervention Model, Conceptual Model of Evidence-Based Practice Implementation in Public Service Sectors.</p>
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Walsh-Bailey 2021	Identify and characterise Frameworks and Models that can be used to study de-implementation as a phenomenon	De-Implementation frameworks and models	Broad	Scoping review	Multiple	<p>Framework of technology obsolescence, Framework for physician decisions to discontinue ongoing medications, Cost framework, Taxonomy for evaluation and explication of disinvestment project, Process model for termination of public goods, Continuum of factors influencing de-implementation process, Conceptual framework for mis-implementation, Conceptual model for deimplementation of low value prostate cancer care, Framework for evaluation and explication of disinvestment projects, Pbma evaluation framework, Potential considerations in prioritizing the testing of unproven medical practice, Medication use process framework, Virtuous cycle of deimplementation, Choosing wisely deimplementation framework, Model for de-implementation strategies, Obsolescence management framework, Health technology reassessment process in Korea, Implementation framework with EBI de-adoption as a distinct stage, Synthesis model for the process of de-adoption, Tool for identifying and discontinuing potentially inappropriate drugs,</p> <p>Health technology reassessment model, Grol 2005 implementation model, Analytical framework for the</p>
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						<p>explanation of policy dismantling, Conceptual framework of potential settings and methods to integrate disinvestment into health service systems and processes, Framework for an organization-wide approach to disinvestment in the local healthcare setting, Path-dependent pattern of retrenchment and corporate turnaround.</p>
Watson 2018	Identify external context constructs likely to impact implementation of complex evidence-based interventions.	No	Complex health interventions that extend into and interact with the larger environment they are embedded within.	Integrative systematic literature review	Multiple	<p>Consolidate Framework for Implementation Research (CFIR), Exploration, Preparation, Implementation, Sustainment (EPIS), Integrated Promoting Action on Research Implementation in Health Services (i-PARIHS), Multi-level framework (MLF) predicting implementation outcomes.</p>

Appendix 6 – Quality Appraisal for included reviews and empirical studies in WP1

CASP Systematic Review Checklist for Included Reviews (not school-based)

	1. Did the review address a clearly focused question?	2. Did the authors look for the right type of papers?	3. Do you think all the important, relevant studies were included?	4. Did the review's authors do enough to assess quality of the included studies?	5. If the results of the review have been combined, was it reasonable to do so?	8. Can the results be applied to the local population?	9. Were all important outcomes considered?	10. Are the benefits worth the harms and costs?
Albers 2017	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Albers 2021	Yes	Yes	Can't tell	Yes	Yes	Yes	Can't tell	Yes
Barker 2016	Yes	Yes	Yes	Can't tell	Yes	Yes	Can't tell	Yes
Bergstrom 2020	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Carroll 2007	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Clinton-McHarg 2016	Yes	Yes	Can't tell	Yes	Yes	Yes	Can't tell	Yes
Damschroder 2009	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Davis 2015	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Dryden-Palmer 2020	Yes	Yes	Can't tell	Yes	Yes	Can't tell	No	Yes
Esmail 2020	Yes	Yes	Yes	No	Yes	Can't tell	Can't tell	Yes
Field 2014	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Greenhalgh 2004	Yes	Yes	Can't tell	Yes	Yes	Yes	Can't tell	Yes
Langer 2016	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Leeman 2019	Yes	Yes	No	No	Yes	Yes	Can't tell	Yes
Leeman 2017	Yes	Yes	No	No	Yes	Yes	Can't tell	Yes

	1. Did the review address a clearly focused question?	2. Did the authors look for the right type of papers?	3. Do you think all the important, relevant studies were included?	4. Did the review's authors do enough to assess quality of the included studies?	5. If the results of the review have been combined, was it reasonable to do so?	8. Can the results be applied to the local population?	9. Were all important outcomes considered?	10. Are the benefits worth the harms and costs?
McGoey 2017	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Meyers 2012	Yes	Yes	No	No	Yes	Yes	Can't tell	Yes
Michie 2011	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Moullin 2019	Yes	Yes	No	Can't tell	Yes	Yes	Can't tell	Yes
Nilsen 2019	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Nilsen 2015	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes
Novins 2013	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Sanchez-Flack 2020	Yes	Yes	Yes	No	Yes	Yes	Can't tell	Yes
Skolarus 2017	Yes	Yes	Yes	No	Yes	Yes	Can't tell	Yes
Stirman 2019	Yes	Yes	Yes	Can't tell	Yes	Yes	Can't tell	Yes
Tabak 2012	Yes	Yes	Can't tell	Yes	Yes	Yes	Can't tell	Yes
Walsh-Bailey 2021	Yes	Yes	Can't tell	Yes	Yes	Yes	Can't tell	Yes
Watson 2018	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes

Mixed-methods Appraisal Tool (MMAT) non-randomised studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	3.1. Are the participants representative of the target population?	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?	3.3. Are there complete outcome data?	3.4. Are the confounders accounted for in the design and analysis?	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?
Goldenthal 2021	Yes	Yes	Yes	Yes	No	No	No
Van Geel 2017	Yes	Yes	No	Yes	Yes	No	Yes

Mixed-methods Appraisal Tool (MMAT) Quantitative Descriptive studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	4.1. Is the sampling strategy relevant to address the research question?	4.2. Is the sample representative of the target population?	4.3. Are the measurements appropriate?	4.4. Is the risk of nonresponse bias low?	4.5. Is the statistical analysis appropriate to answer the research question?
Bejarano 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bosworth 1999	Yes	Yes	Yes	No	Yes	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) Qualitative studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1.1. Is the qualitative approach appropriate to answer the research question?	1.2. Are the qualitative data collection methods adequate to address the research question?	1.3. Are the findings adequately derived from the data?	1.4. Is the interpretation of results sufficiently substantiated by data?	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?
Allen 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alonge 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baker 2021	Yes	Yes	Yes	Can't tell	Can't tell	Can't tell	Can't tell
Bingham 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cane 2015	Yes	Yes	Yes	Yes	Yes	No	Yes
Chambers 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cook 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corboy 2007	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Evans 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frigge 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gale 2020	Yes	Yes	Yes	Yes	Yes	No	Yes
Hudson 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lyon 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mills 2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Moore 2017	Yes	Yes	Yes	Yes	Can't tell	No	Yes

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1.1. Is the qualitative approach appropriate to answer the research question?	1.2. Are the qualitative data collection methods adequate to address the research question?	1.3. Are the findings adequately derived from the data?	1.4. Is the interpretation of results sufficiently substantiated by data?	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?
Sharma 2005	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weathers on 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weston 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) Mixed-methods studies (Qualitative + Non-randomised)

			1. Qualitative					3. non-randomised					5. Mixed method studies				
Author	S1	S2	1.1	1.2	1.3	1.4	1.5	3.1	3.2	3.3	3.4	3.5	5.1	5.2	5.3	5.4	5.5
Austin 2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Hollingshead 2009	Yes	Yes	Yes	Yes	Can't tell	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Can't tell
Nordstrum 2017	Yes	Yes	Yes	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Yes	Yes	No	Yes	Yes	No
Tunks 2009	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No

Mixed-methods Appraisal Tool (MMAT) Mixed-methods studies (Qualitative and quantitative descriptive studies)

			1. Qualitative					4. Quantitative descriptive studies					5. Mixed method studies				
Author	S1	S2	1.1	1.2	1.3	1.4	1.5	4.1.	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5

Fenton 2002	Yes	Yes	No	No	Can't tell	Yes	Yes	Can't tell	Can't tell	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	No
Garvis, 2013 A	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Leeman, 2018 A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Appendix 7 – TMF Synthesis WP1

Theory/Model/Framework	Developer	Category	Field	Focus	Description	Included papers	Evidence for application to school implementation
TMFs used in implementation reviews and school implementation studies							
Consolidated Framework for Implementation Research (CFIR)	Damschroder et al. (2009, 2022)	Determinant framework	Implementation science	Any, whole process	<p>CFIR offers a range of constructs that have been associated with effective implementation. Authors reviewed constructs in existing framework and theories to compile them into one framework. The constructs are organised across five domains which represent different levels of implementation involving people, systems and innovations. The CFIR can be used to assess barriers and facilitators and guide planning implementation strategies. The 2009 CFIR version provides 26 implementation constructs that are arranged across five domains 1) INTERVENTION CHARACTERISTICS (includes eight constructs); 2) OUTER SETTING (includes four constructs); 3) INNER SETTING (includes five constructs) 4) CHARACTERISTICS OF INDIVIDUALS (includes five constructs); 5) PROCESS (four constructs).</p>	<p>Systematic reviews that included the CFIR looked at different applications of it (e.g. scale-up, factors influencing implementation of interventions, knowledge translation in clinical settings, constructs for public health and community settings). All nine were broad in their setting focus (Albers et al., 2017, Barker et al., 2016, Clinton-McHarg et al., 2016, Esmail et al., 2020, Meyers et al., 2012, Nilsen et al., 2019, Skolarus et al., 2017, Tabak et al., 2012, Watson et al., 2018). Only Clinton-McHarg et al. (2016) used CFIR in isolation to consider domains of implementation measures. All other reviews were located CFIR alongside a range of TMFs.</p> <p>Eight school papers that included the CFIR focused on aspects of health (e.g.: physical activity programs, diabetes care, health policy, a mindfulness intervention, sexual health, and general health education). (Allen et al., 2021, An et al., 2021, Bejarano et al., 2019, Cassar et al., 2019, Hudson et al., 2020, Leeman et al., 2018, Leung et al., 2020, McLoughlin et al., 2021). They focused on factors affecting implementation drawing on CFIR or developed data collection tools, such as interviews and questionnaires, to measure barriers and facilitators of implementation in line with CFIR. Allen et al (2021) adapted CFIR to a race-conscious framework to understand ways that structural racism interacts with intervention implementation and uptake.</p>	<p>Not all school papers clearly demonstrated evidence of the application of CFIR to school contexts. Three papers used CFIR to develop a further TMF specific to their research (Allen et al., 2021, An et al., 2022; Leeman et al., 2018). Cassar et al. (2019) identified which TMFs are used in school-based physical activity trials, reporting CFIR was more often used for interpreting results and planning evaluation than intervention design. The remaining studies used CFIR to guide their evaluation and/or analysis of factors affecting implementation.</p> <p>An et al. (2022) used some CFIR constructs related to inner and outer setting and individual characteristics to model complex interactions between stakeholders in relation to school diabetes care.</p> <p>Allen et al. (2021) used CFIR to identify barriers and facilitators and then applied critical race praxis within each construct. Their results indicated that, although leaders may support equity in principle, they may not truly understand what equity promoting interventions aim to do given the prevailing narratives and racial legacies within their institutions, or they may not be fully comfortable with the ultimate intention of these interventions (i.e., tension for change), which may be to disrupt the status quo.</p> <p>McLoughlin et al. (2021) used CFIR alongside the implementation outcomes framework and policy implementation determinants framework to describe school health policy implementation outcomes and determinants. Using these TMFs allowed identification of implementation outcomes and key determinants such as readiness, resources, leadership and communication.</p> <p>Hudson et al. (2020) used the CFIR to guide qualitative data analysis. They concluded using the CFIR allowed for results to be generalizable and therefore applicable to other school settings and that the CFIR seems to be useful for identifying barriers and facilitator to EBP's in schools and inform how we understand outcomes of 'services' delivered in schools and point to the need for system organisation in these complex settings to ensure EBPs reach target users.</p> <p>Leeman et al. (2018) used CFIR with ISF, specifically to categorise factors that may facilitate or hinder use of implementation tools in schools. Findings suggest that CFIR may be a useful framework for use in formative work to identify factors that need to be considered so that tools are designed to align with user's needs, preference, and contexts. However, they also concluded that he CFIR does not describe the processes that external change agents use to influence implementation.</p>

Diffusion of Innovations (DI)	Rogers (2003)	Classic theory	Social science/behaviour change	Any, whole process	Originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The result of this diffusion is that people, as part of a social system, adopt a new idea, behaviour, or product. Adoption means that a person does something differently than what they had previously. The key to adoption is that the person must perceive the idea, behaviour, or product as new or innovative. It is through this that diffusion is possible.	Reviews that included DI were broad in their setting focus; none was solely focused on a school-related setting. The reviews that included DI always identified multiple TMF relevant to public health or implementation science. (Davis et al., 2015; Tabak et al., 2012; Dryden-Palmer et al., 2020; Skolarus et al., 2017; Nilsen et al., 2015) The school papers that discussed DI were 1) two systematic reviews that explored the adoption of physical activity interventions (Cassar et al., 2019, Olstad et al., 2015). 2) A discussion paper that uses DI to explain why interventions for autism are rarely adopted, implemented, and maintained in community settings (Dingfelder et al., 2011). 3) An overview of DI and how it can be applied to media literacy programs (Yates et al., 2001). 4) A process evaluation to explain the adoption, implementation and discontinuance of a social and emotional learning (SEL) intervention (Evans et al., 2015)	The school paper systematic reviews did not demonstrate evidence for DI per se, rather how it was used to interpret findings (Cassar 2019, Olstad 2015). Dingfelder et al. (2011) and Yates et al. (2001) also drew on DI in a similar way. Evans et al. (2015) showed more evidence of the relevance of DI in their process evaluation. They evidenced four key intervention reinvention points, which contributed to the transformation of the programme as it interacted with contextual features and individual needs. 1) Intervention training 2) intervention assessment, 3) intervention clarification, and 4) intervention responsibility.
Exploration Preparation Implementation and Sustainment (EPIS)	Aarons et al., 2011, 2012; Hurlburt et al., 2014	Implementation conceptual model (Not in Nilsen)	Implementation science	Public mental health and social service settings. Whole process	Developed specifically for public mental health and social service settings. It divides the dissemination and implementation process into the following 4 phases: 1) Exploration; 2) Preparation; 3) Implementation and 4) Sustainment. The EPIS model also emphasises the importance of contextual factors, both inside the unit providing services as well as those in the larger environment in which the service unit operates (Aarons et al., 2011).	Four reviews included EPIS, one looked at multiple implementation frameworks used in child, youth and family services (Albers et al., 2017), another looked at the implementation of complex evidence-based interventions (Watson et al., 2018). Two focused on EPIS; Novins et al. (2013) focused on child and adolescent mental health interventions and Moullin et al. (2019) focused more generally on health and social care interventions. Three school papers drew on EPIS, including the current EEF Guidance Report (EEF, 2019). Lyon et al. (2018) used EPIS to establish contexts relevant to mental health clinicians working in schools. Goldstein et al. (2015) used EPIS to describe the process of developing and implementing a supplemental early literacy curriculum designed for pre-schoolers.	EEF (2019) and Lyon et al. (2018) show the relevance of EPIS in their application of this TMF. Goldstein et al. (2015) concluded that the use of the EPIS model may have increased the effectiveness of the intervention at the level of outer context (organizational networks) and at the inner context level (individual teacher characteristics)
Expert Recommendations for Implementing Change (ERIC)	Powell et al., 2015	Compilation of implementation strategy terms and definitions (Not in Nilsen)	Implementation science	Any, implementation support	Aim to improve the conceptual clarity, relevance, and comprehensiveness of implementation strategies that can be used in isolation or combination in implementation research and practice.	Albers et al. (2021) scoping review looked at how ERIC was used by implementation support practitioners (ISP) across multiple bodies of research on implementation support and how these strategies were applied in practice settings. Cook et al. (2019) used an adaptation process that took ERIC and adapted and refined it to produce a new taxonomy for the educational sector (SISTER). Lyon et al. (2019) replicated a component of the ERIC project assessing the feasibility and importance of the SISTER strategies.	Cook et al. (2019) and Lyon et al. (2019) have adapted ERIC for the educational sector, although this was not assessing the application of ERIC for school-based implementation.
National Implementation Research Network (NIRN model) (Fixsen et al.)	Fixsen et al. (2005); Fixsen et al. (2009) Fixsen et al. (2010)	Determinant framework	Implementation science	Any and whole process	Identified six essential stages in implementation: exploration, installation, initial implementation, full implementation, innovation, and sustainability. Stages do not progress linearly, but interact with each other throughout. Several core components, or 'Implementation drivers,' have also been identified and are classified as Competency Drivers (e.g., staff selection, training, and coaching), Leadership Drivers, and Organization Drivers (e.g., facilitative administration, decision support data systems) (Hanson 2015).	Meyers et al. (2012) included Fixsen their synthesis of literature to develop a new implementation meta-framework: Quality Implementation Framework (QIF). Two scoping reviews included Fixsen's stages. Leeman et al. (2017) aimed to advance theory to guide the design of capacity building strategies, with a specific focus on strategies to adopt and implement community-based prevention Evidences Based interventions and Nilsen et al. (2019) aimed to investigate and map how determinant frameworks were developed, what terms are used for contextual determinants, how the context is conceptualised, and which context dimensions that can be discerned. One school discussion paper Odom et al. (2014) used the Fixsen et al. model to describe a set of implementation science principles and practices that could be employed in supporting the adoption and implementation of a comprehensive program for high school students with ASD.	Evidence not reported

Getting To Outcomes (GTO)	Wandersman (2000); Chinman (2004)	Process model (Not in Nilsen)	Implementation science -adoption	adopting using community-centred (CC) processes	Developed to help practitioners achieve outcomes and satisfy accountability demands through processes of planning, implementation, and evaluation. Includes 10 steps to guide readers and practitioners through the planning, implementation, and evaluation stages to produce a quality, results-driven program. Best practice process that is grounded in a Community Centred model and is practitioner-friendly.	<i>Albers et al. (2017)</i> scoping review focused on child, youth and family services which aimed to identify studies employing an implementation framework; map the literature, ascertain the ways in which frameworks are being tested; and describe the current state of evidence surrounding their use in this field <i>Meyers et al. (2012)</i> included GTO in their synthesis of literature in order to develop a new implementation meta-framework: Quality Implementation Framework (QIF). <i>Splett et al. (2011)</i> , a school discussion paper, argues that unilateral emphasis on EBPs in school mental health has hindered progress in the field of School Psychology and that the GTO framework should be considered for use.	Recommended by <i>Splett et al. (2011)</i> rather than applied to an example of school-based implementation.
Interactive Systems Framework for Dissemination and Implementation (ISF)	Wandersman et al., 2008	Process model (Not in Nilsen)	Implementation science	Any and whole process	ISF uses aspects of research to practice models and of community-centred models. The framework presents three systems: the Prevention Synthesis and Translation System (which distills information about innovations and translates it into user-friendly formats); the Prevention Support System (which provides training, technical assistance or other support to users in the field); and the Prevention Delivery System (which implements innovations in the world of practice). The framework is intended to be used by different types of stakeholders (e.g., funders, practitioners, researchers) who can use it to see prevention not only through the lens of their own needs and perspectives, but also <u>as a way to better understand the needs of other stakeholders and systems</u> . It provides a heuristic for understanding the needs, barriers, and resources of the different systems, as well as a structure for summarizing existing research and for illuminating priority areas for new research and action.	<i>Meyers et al. (2012)</i> included ISF their synthesis of literature in order to develop a new implementation meta-framework: Quality Implementation Framework (QIF). Two scoping reviews included ISF, <i>Leeman et al. (2017)</i> aimed to advance theory to guide the design of capacity building strategies, with a specific focus on strategies to adopt and implement community based prevention Evidences Based Interventions and <i>Albers et al. (2017)</i> focused on child, youth and family services which aimed to identify studies employing an implementation framework. <i>Skolarus et al. (2017)</i> included ISF in a citation network analysis of D&I research frameworks focused on research-to-practice activities at different socio-ecologic levels within the health care system. Two school papers included ISF. <i>Leeman et al. (2018)</i> conducted an evaluation using two frameworks ISF and CFIR of state, school district, and local school staffs' use of four U.S. Centers for Disease Control and Prevention (CDC) tools to support implementation of physical activity, nutrition, health education, and parent engagement interventions. The ISF was applied to differentiate between two types of implementation tool users—those working in support systems versus those working in delivery systems. <i>Flaspohler et al. (2008)</i> provided a discussion paper that <u>compares and contrasts the Multilevel Implementation Quality Framework (Domitrovich et al., 2008)</u> with other emerging frameworks, theories, and models emerging in health services literature and describe the application of the ISF to support strengthening implementation of Expanded School Mental Health Services (ESMH).	Only one review, <i>Albers et al. (2017)</i> , provided evidence from two projects that had used the ISF. One study aimed to understand the relation between general program capacity and implementation in afterschool settings by conducting a pre-post evaluation of how organizational and community capacity impacts on the implementation of the Good Behavior Game intervention (GBG) (Halgunseth et al., 2012). It concluded that ' <i>ISF's understanding of the importance of the support system & capacities are valid.</i> ' The second was a case study presenting the ISF as a guide for planning, structuring and a lens for understanding implementation processes. Using a kindergarten program 'Ready Freddy'. Concludes that ISF is relevant in several situations of implementation (Smythe-Leistico et al., 2012). <i>Leeman et al. (2018)</i> concludes how CFIR and the ISF might be applied to evaluate factors influencing the use of implementation tools in both support and delivery systems. These factors may be applied to improve the design of school health and potentially other types of implementation tools that are applied across multi-tiered support and delivery systems. <i>Flaspohler et al. (2008)</i> concluded that ' <i>participation in the discussion about the ISF helped stakeholders to understand the complexity of the ESMH service system, and afforded participants the opportunity to complete organizational analysis in Ohio, using a common lens and a common language. Barriers and solutions emerged, along with specific recommendations from workgroups.</i> '

Normalization process theory (NPT)	May et al 2009 & 2011	Implementation theory	Implementation science	Any, whole	<p>Normalization Process Theory is a theory that identifies four determinants of embedding (i.e. normalising) complex interventions in practice (coherence or sense making, cognitive participation or engagement, collective action and reflexive monitoring) and the relationships between these determinants (Nilsen 2015).</p>	<p>SR's: <i>Leeman 2017</i>, a scoping review, included NPT. It aimed to advance theory to guide the design of capacity building strategies, with a specific focus on strategies to adopt and implement community based prevention Evidence Based Interventions (EBIs). <i>Nilsen 2015</i> included NPT, this review aimed to propose a taxonomy that distinguishes between different categories of theories, models and frameworks in implementation science. <i>Skolarus 2017</i> included NPT in a citation network analysis of D&I research frameworks focused on research-to-practice activities at different socio-ecologic levels within the health care system. <i>Tabak 2012</i> included NPT in its narrative review of models used in dissemination and implementation (D&I) science. Three school papers used NPT. <i>Frigge 2019</i> used NPT in a process evaluation to evaluate the implementation and integration of a school breakfast program (SBP). <i>Chambers 2020</i> used NPT to examine the implementation of Universal Free School Meals (UFSM) in Scotland. While <i>Wood 2017</i> discuss what NPT might offer in practical terms to aid organizations and leaders in bringing about more sustainable and positive change in educational contexts.</p>	<p><i>Frigge et al. (2019)</i> concluded that utilising NPT to evaluate the expanded SBP into the school environment can be particularly helpful in providing ways to implement expanded SBPs in rural schools that have limited resources. Also suggested taking a student-centred approach to the intervention and working with staff and students to define and develop a modified school program can assist with implementing and integrating the program into the school environment and that this approach may also support program acceptance and normalization among students and staff. <i>Woods et al. (2017)</i> concluded that 'NPT offers a potentially useful tool to help evaluate and support processes leading to normalization of practice, whilst also emphasizing some of the dynamics of organizational work which are likely to lead to positive change'. <i>Chambers et al. (2020)</i> agreed with findings of <i>Woods et al. (2017)</i> but also added that one of the main advantages of applying the NPT framework was that the identification of evidence for each of the sub-constructs within the data aided understanding of the more subtle nuances within each of the four main constructs.</p>
PRomoting School/Community - University Partnerships to Enhance Resilience (PROSPER)	Spoth et al. (2004); Spoth and Greenberg (2005)	Implementation conceptual model -Not in Nilsen	Implementation science	School and whole	<p>A model to guide capacity-building in state public education systems for delivery of evidence-based family and youth interventions—interventions that are designed to bolster youth competencies, learning, and positive development overall. Central to this effort is a linking capacity agents framework that builds upon longstanding state public education infrastructures, and a partnership model. Advocates a collaboration among communities, school districts and university-based prevention scientists. PROSPER has five core components, which together represent an effort to foster the translation of science into effective community practice:(1) The PROSPER community team, (2) A three-tier partnership structure based in the land-grant university system and supporting stable, proactive technical assistance,(3) A multi-phased partnership developmental process oriented toward sustainability,(4) Evidence-based interventions selected from a menu,(5) Ongoing process and outcome evaluation.</p>	<p>One review included PROSPER, <i>Meyers et al. (2012)</i> synthesised literature in order to develop a new implementation meta-framework: Quality Implementation Framework (QIF). From the school papers, <i>Nordstrum et al. (2017)</i> used PROSPER as part of a process evaluation to look at the reach, adoption, use and maintenance of innovations and discoveries in diverse education contexts.</p>	<p><i>Nordstrum et al. (2017)</i> concluded that 'PROSPER showed that using proactive technical assistance and support, and instituting an ongoing quality monitoring system, are implementation factors that are clearly linked to rapid, effective and efficient translation of the science of preventative health intervention into community practice.'</p>

RE-AIM	Glasgow et al, 1999	Evaluation framework	Implementation science	Public health	A model for evaluating public health interventions that assesses 5 dimensions: reach, efficacy, adoption, implementation, and maintenance. These dimensions occur at multiple levels (e.g., individual, clinic or organization, community) and interact to determine the public health or population-based impact of a program or policy.	Four reviews included RE-Aim in their search for TMF's: (Nilsen, 2015; Tabak et al 2012; Esmail et al 2020; Skolarus et al 2017). Two further reviews focused on health issues, McGoey et al. (2017) used RE-AIM to determine the extent to which intervention studies promoting physical activity in youth report on factors that inform generalizability across settings and populations, including schools. Sanchez-Flack et al. (2020), aimed to determine the availability of data on both internal and external validity across dimensions of RE-AIM in studies reporting on obesity prevention interventions in early childcare/education settings focused on children aged 2–6 years old. Two school papers were SR's of school-based physical activity (PA) interventions. Cassar et al. (2019) identified which implementation models are used in effectiveness, dissemination, and/or implementation trials, and also identified factors associated with the adoption, implementation and sustainability interventions in real-world settings. While Kennedy et al. (2020) determined the extent to which studies of school-based PA interventions were implemented at-scale and reported information across the RE-AIM dimensions. Austin et al. (2011) conducted a qualitative study to understand the barriers and facilitators in adopting, implementing, and maintaining a school-based physical activity intervention using RE-AIM as a theoretical evaluation framework. Merrell (2006) provides a discussion in which the authors see the RE-AIM framework as a public health model that may help to bridge the gap between the solid research innovations reflected by the evidence-based intervention movement and implementation of these interventions in the real world.	Sanchez-Flack et al. (2020) found that the most reported dimensions were Reach, Implementation and Efficacy/Effectiveness. However Adoption and Maintenance were less often reported. They identify that all included studies reported on primary outcomes, but few reported on RE-AIM indicators of characteristics of participation and adoption, quality of life, methods used to identify staff, staff inclusion/exclusion criteria and adoption rates, implementation fidelity, measures of cost to start-up and deliver the intervention, and indicators of maintenance. McGoey et al.'s (2017) findings include an assessment of PA intervention generalizability to field settings, and consideration of variables that may moderate intervention efficacy/effectiveness, such as resource availability, implementation fidelity and possible incorporation into the daily routine and emphasized the need for researchers to tailor their future designs to be able to report on elements of both internal and external validity. Concluded that included studies shared a focus on reporting internal validity factors, and a shared underreporting of adoption, implementation and maintenance indicators. Austin et al. (2011) concluded that the RE-AIM framework was a good theoretical model for comprehensive public health evaluation although the authors identified that the modification of the framework for its application at a setting level versus both individual and setting levels posed some challenges. In particular, the differentiation between reach and adoption and the identification of appropriate evaluation measures. Merrell (2006) gives examples of the relevance to schools and concludes this framework has direct application in schools.
TMFs in school implementation papers							
Concerns Based Acceptance Model (CBAM)	Hall, G. E., & Hord, S. M. (1987).	theoretical model/framework- Not in Nilsen	complex process of change in education	Whole process of school adopting innovations	CBAM's has three main constructs for assessing and guiding effective implementation of a new program in schools: 1. Stages of Concern (SoC), addresses the concerns of the people charged with implementing it. 2. Innovation Configuration Map (iC Map), school leaders' work with staff to develop a unique set of expected actions and behaviours for each person or role involved in a program. 3. Levels of Use (LoU) is series of questions that a facilitator asks a staff member and enables educators to know the extent to which staff are using a new program and if they are at the beginning stage or at a more advanced level	Six studies used the CBAM in the school setting using mixed or qualitative methods to understand the adoption (Fenton 2002), extent of implementation (Hall 2013; Trapani & Annunziato, 2018), changes in the teachers' behaviours (Tunks 2009), the change process (Gabby et al., 2017; Hollingshead 2009) of implementation of education programs, these studies were all conducted in USA, except Gabby et al. (2017) which was conducted in Israel. Roach (2009) wrote a discussion paper of the change facilitator's role in promoting changes in educational practices and a description of six essential strategies consultants can use to facilitate change.	Fenton (2002) concluded that the model helped understand status and direction of the goal of having a standards-based instructional system that results in student success. Gabby et al. (2017) concluded that when CBAM was used in conjunction with other research tools it enabled them to tailor a specific profile of concerns, insights into the implementation of the model and later the analysis of the data. Hollingshead (2009) concluded that CBAM is a comprehensive approach for studying the change process, diagnosing attitudes and behaviour's surrounding an initiative.
The Active Implementation Frameworks (AIF)	Unclear authorship Fixsen, Metz?	Implementation framework Not in Nilsen	Implementation science	Any and whole	AIFs are an evidence-based set of frameworks developed following a systematic review and synthesis of the implementation evaluation literature. The AIFs consists of five core components: (1) a Usable Innovation, (2) Implementation Drivers, (3) Implementation Stages, (4) Improvement Cycles, and (5) Implementation Teams (PharmD et al)	Ryan Jackson et al. (2018) is a discussion on rapid school improvement includes AIF and other frameworks. Sims et al. (2017) is also a discussion in a chapter intended to help educators and mental health professionals become familiar with five overarching frameworks.	Neither paper applied the TMF to school implementation.

Conceptual Model of School-Based Implementation (CMSBI)	Greenberg et al., 2005	Evaluation framework – Not in Nilsen	Implementation science - schools	Schools, evaluation of implementation quality	Implementation quality is based on the discrepancy between the intervention as planned and the intervention as delivered, and the discrepancy between the implementation support as planned and the implementation support as delivered. Four dimensions of a planned intervention can be evaluated: program model; quality of delivery; target audience; and participant responsiveness. The aspects of implementation support that can be evaluated are: pre-planning; quality of materials; quality of technical support; and implementer readiness	Corboy 2007 used CMSBI to conduct an evaluation examining the process of implementation of the CAMHS (Child and Adolescent Mental Health Service) and Schools Together (CAST) program in primary schools. Cassar 2019 included CMSBI in their systematic review looking at models used in school-based physical activity effectiveness, dissemination, and/or implementation trials.	Corboy et al. (2007) concluded that CMSBI was a robust and useful framework and allowed for close examination of how the CAST program was implemented within naturally occurring constraints, and what key factors and issues in the school setting affected the quality of program implementation. The model was particularly useful in pinpointing aspects of the implementation process that did not go to plan. A limitation identified is that it does not sufficiently attend to the partnerships that underpin successful implementation of school-based preventive programs.
TMFs in reviews not used in schools							
Promoting Action on Research Implementation in Health Services (PARIHS)	Kitson (1997), (Rycroft-Malone 2002)	Determinant framework, in Nilsen	Implementation science	Health (mainly primary care)	Reflects the relationship between context, complexity and process that occur with the introduction of evidence based innovation into practice. PARIHS has 3 categories (1 relates to contextual influences): Evidence, Facilitation, and Context. Also mentions i-PARIHS which has 4 categories (2 relate to contextual influences): Innovation, Facilitation, Recipients, Context	Included in seven reviews that sought to find a range of TMFs: Meyers 2012, Bergstrom 2020, Tabak 2012, Leeman 2017, Watson 2018; Nilsen 2019, Dryden-Palmer 2020	None located

Appendix 8 – Survey WP2

School Improvement Survey: What Works, When and for Who?

Survey Flow

Standard: Participant Information Sheet (1 Question)

Standard: Participant Consent (1 Question)

Standard: Summary of sections (1 Question)

Standard: About You (5 Questions)

Standard: About Your School (18 Questions)

Standard: About a new approach, programme, intervention or strategy (29 Questions)

Standard: About sources of support (7 Questions)

Standard: contact info for summary of results and interview data collection (2 Questions)

Start of Block: Participant Information Sheet

Q1

You are being invited to take part in an academic research study. Before you decide to participate, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. To continue, please press the arrow at the bottom of the page.

Purpose of the research

The aim of this survey is to better understand how approaches are selected and put in place by schools, what the challenges are in different contexts and what helps to maximise the chances of pupil success.

Who can take part?

This survey is aimed at educators who have a responsibility for introducing new approaches in their educational context (including early years, primary, secondary and further education providers). This may include but is not limited to: Headteacher, Chief Executive, Deputy/Assistant Headteacher, Director, Principal, SEN Coordinator, Director of Teaching and Learning, Behaviour Lead, Head of Pastoral Services, Head of Department.

What will I be asked to do?

This survey will invite you to share an example of a new approach (practice, programme, intervention or strategy) that has been introduced in your school in the last 3 academic years. We will ask you to tell us about the change you introduced and answer rating and optional short, free-text questions about things that helped or hindered you in choosing what to change, planning, making and sustaining the change. You will also have the option to share a relevant plan with us. The survey should take no more than 20 minutes to complete. Researchers plan to interview some survey respondents online or by phone. You will be asked to leave contact details only if this is something you might consider, or you would like to find out about the study findings.

Who is doing this research?

This study is being conducted by researchers at the University of Exeter, University of Plymouth and Cardiff University. The lead researcher is Darren Moore, a senior lecturer in

the Graduate School of Education at the University of Exeter (d.moore@exeter.ac.uk).

Ethical review of this Research

This study has been reviewed and approved by the Graduate School of Education Research Ethics Committee at the University of Exeter. The review reference is W489803. The Graduate School of Education Ethics Committee may be contacted by email at ssis-gseethics@exeter.ac.uk.

Benefits and risks of taking part

We hope completing this survey is a useful activity to reflect on leading change in schools. Aside from the option to receive information about study findings, there is unlikely to be any other direct or personal benefit to you in taking part. Project findings will be used to inform guidance for educators that will be shared widely. There are no risks to taking part greater than what you may encounter daily in your normal life. If you feel any discomfort or doubt about taking part you can stop completing the survey.

Voluntary participation and your right to withdraw

Your participation in this study is entirely voluntary. You are under no obligation to take part. If you stop before completing the survey your information will not be used and you will not have completed the survey. You may also choose to withdraw your responses after completing the survey up until the end of April 2022.

Anonymity

This survey is anonymous. You can leave personal details to be updated about the results of the study, find out more about participating in an interview or to withdraw your data at a later date. If you do leave your personal details, these will be stored securely and separately to your survey responses. It will not be possible to identify you or your school in any study publications. The Data Controller for this research is the University of Exeter. You may contact the Information Governance office of the University of Exeter by emailing dataprotection@exeter.ac.uk.

[University of Exeter Data Protection for Research Statement](#)

The Results

Results will be published or presented in academic papers and workshops and feed into a guidance report for educators. If you would like to know about the results of this study, there will be an option at the end of the survey to leave your contact details.

End of Block: Participant Information Sheet

Start of Block: Participant Consent



Q2 Thank you for your interest in this study. Before you begin, please select each consent statement to indicate your agreement:

- I have read and understand the information provided on the previous page. (1)
- I understand that my participation is voluntary. (2)
- I understand that taking part involves anonymised survey responses to be used for the purposes of academic publication and practitioner guidance. (3)
- I understand that I may withdraw and stop participating at any time during the survey, my responses will not be saved. (4)

- I understand that there will be no negative consequences for withdrawal. (5)
- I understand that once submitted, I will have until April 2022 to withdraw my data. (6)

End of Block: Participant Consent

Start of Block: Summary of sections

Q3 Thanks for completing this survey, we appreciate your time.

The survey should take no longer than 20 minutes to complete. There are four sections of the survey. The first section asks some brief questions about you and your school. Section 2 focuses on the experience of introducing an approach in your school. Section 3 briefly asks about school improvement more generally. Section 4 asks for contact details if you are interested in learning about the study's findings and participating further.

Please note there is a bar at the top of the screen, to show your progress through the survey.

End of Block: Summary of sections

Start of Block: About You

Q4 Section 1 of 4: About you and your school

The first set of questions will help us to see who has answered the survey, their role and the type of education provider they represent. In the survey we use "school" as a term for all providers that span the age range 3-18, including nurseries and colleges.

Q5 Which of these terms best describes your current job role?

- Chief Executive/ Executive Headteacher (8)
- Headteacher/ Head of School/ Principal (1)
- Deputy/Assistant Head (2)
- Other Senior Leadership Team (5)
- Other (7)

Display This Question:

If Which of these terms best describes your current job role? = Other Senior Leadership Team

Or Which of these terms best describes your current job role? = Other

Q6 Please specify your job role

Q7 How long have you been in your current job role? (years)

- ☐ 0-1 (1)
- ☐ 2-4 (2)
- ☐ 5-9 (3)
- ☐ 10-19 (4)
- ☐ 20-29 (5)
- ☐ 30+ (6)

Q8 Do you work in a single school or across multiple schools?

- ☐ A single school (1)
- ☐ Multiple schools (2)

End of Block: About You

Start of Block: About Your School

Display This Question:

If Do you work in a single school or across multiple schools? = A single school

Q9 Which phase is your school?

- ☐ Nursery (1)
- ☐ Primary (Including middle, deemed primary) (2)
- ☐ Secondary (Including middle, deemed secondary) (9)
- ☐ Further Education/Post-16 (5)
- ☐ Other (6)

Display This Question:

If Which phase is your school? = Other

Q10 Please specify the age range of your school

Display This Question:

If Do you work in a single school or across multiple schools? = Multiple schools

Q11 Which phase are your schools? (Please select multiple if necessary)

- Nursery (1)
- Primary (Including middle, deemed primary) (2)
- Secondary (Including middle, deemed secondary) (7)
- Further Education/Post-16 (5)
- Other (6)

Display This Question:

If Which phase are your schools? (Please select multiple if necessary) = Other

Q12 Please specify the age range of your schools below

Display This Question:

If Do you work in a single school or across multiple schools? = A single school

And Which phase is your school? = Primary (Including middle, deemed primary)

Or Which phase is your school? = Secondary (Including middle, deemed secondary)

Or Which phase is your school? = Other

Q13 What type of school do you work in?

- Academy (1)
- Community (2)
- Foundation (12)
- Free School (3)
- Grammar (15)
- Independent (4)
- Voluntary Aided / Voluntary Controlled (5)
- Other / Multiple apply (10)

Display This Question:

If What type of school do you work in? = Other / Multiple apply

Q14 Please specify the type of school you work in below

Display This Question:

If Do you work in a single school or across multiple schools? = A single school

Q15 In which local authority is your school located?

- ☐ Barking and Dagenham (1)
- ☐ Barnet (2)
- ☐ Barnsley (3)
- ☐ Bath and North East Somerset (4)
- ☐ Bedford (5)
- ☐ Bexley (6)
- ☐ BFPO Overseas Establishments (7)
- ☐ Birmingham (8)
- ☐ Blackburn with Darwen (9)
- ☐ Blackpool (10)
- ☐ Bolton (11)
- ☐ Bournemouth, Christchurch and Poole (12)
- ☐ Bracknell Forest (13)
- ☐ Bradford (14)
- ☐ Brent (15)
- ☐ Brighton and Hove (16)
- ☐ Bristol, City of (17)
- ☐ Bromley (18)
- ☐ Buckinghamshire (19)
- ☐ Bury (20)
- ☐ Calderdale (21)
- ☐ Cambridgeshire (22)
- ☐ Camden (23)
- ☐ Central Bedfordshire (24)
- ☐ Cheshire East (25)
- ☐ Cheshire West and Chester (26)
- ☐ City of London (27)
- ☐ Cornwall (28)
- ☐ County Durham (29)
- ☐ Coventry (30)
- ☐ Croydon (31)
- ☐ Cumbria (32)
- ☐ Darlington (33)
- ☐ Derby (34)
- ☐ Derbyshire (35)
- ☐ Devon (36)
- ☐ Doncaster (37)
- ☐ Dorset (38)
- ☐ Dudley (39)
- ☐ Ealing (40)
- ☐ East Riding of Yorkshire (41)
- ☐ East Sussex (42)
- ☐ Enfield (43)

- Essex (44)
- Fieldwork Overseas Establishments (45)
- Gateshead (46)
- Gloucestershire (47)
- Greenwich (48)
- Hackney (49)
- Halton (50)
- Hammersmith and Fulham (51)
- Hampshire (52)
- Haringey (53)
- Harrow (54)
- Hartlepool (55)
- Havering (56)
- Herefordshire, County of (57)
- Hertfordshire (58)
- Hillingdon (59)
- Hounslow (60)
- Isle of Wight (61)
- Islington (62)
- Kensington and Chelsea (63)
- Kent (64)
- Kingston upon Hull, City of (65)
- Kingston upon Thames (66)
- Kirklees (67)
- Knowsley (68)
- Lambeth (69)
- Lancashire (70)
- Leeds (71)
- Leicester (72)
- Leicestershire (73)
- Lewisham (74)
- Lincolnshire (75)
- Liverpool (76)
- Luton (77)
- Manchester (78)
- Medway (79)
- Merton (80)
- Middlesbrough (81)
- Milton Keynes (82)
- Newcastle upon Tyne (83)
- Newham (84)
- Norfolk (85)
- North East Lincolnshire (86)
- North Lincolnshire (87)
- North Northamptonshire (88)
- North Somerset (89)
- North Tyneside (90)
- North Yorkshire (91)
- Northumberland (92)
- Nottingham (93)
- Nottinghamshire (94)
- Oldham (95)
- Oxfordshire (96)
- Peterborough (97)
- Plymouth (98)

- Portsmouth (99)
- Reading (104)
- Redbridge (105)
- Redcar and Cleveland (106)
- Richmond upon Thames (107)
- Rochdale (108)
- Rotherham (109)
- Rutland (110)
- Salford (111)
- Sandwell (112)
- Sefton (113)
- Sheffield (114)
- Shropshire (115)
- Slough (116)
- Solihull (117)
- Somerset (118)
- South Gloucestershire (119)
- South Tyneside (120)
- Southampton (121)
- Southend-on-Sea (122)
- Southwark (123)
- St. Helens (124)
- Staffordshire (125)
- Stockport (126)
- Stockton-on-Tees (127)
- Stoke-on-Trent (128)
- Suffolk (129)
- Sunderland (130)
- Surrey (131)
- Sutton (132)
- Swindon (133)
- Tameside (134)
- Telford and Wrekin (135)
- Thurrock (136)
- Torbay (137)
- Tower Hamlets (138)
- Trafford (139)
- Wakefield (140)
- Walsall (141)
- Waltham Forest (142)
- Wandsworth (143)
- Warrington (144)
- Warwickshire (145)
- West Berkshire (146)
- West Northamptonshire (147)
- West Sussex (148)
- Westminster (149)
- Wigan (150)
- Wiltshire (151)
- Windsor and Maidenhead (152)
- Wirral (153)
- Wokingham (154)
- Wolverhampton (155)
- Worcestershire (156)
- York (157)

Display This Question:

If Do you work in a single school or across multiple schools? = Multiple schools

Q16 In which local authority are your schools located? (If your schools belong to more than one, please choose the local authority where most of your schools are located)

- ☐ Barking and Dagenham (1)
- ☐ Barnet (2)
- ☐ Barnsley (3)
- ☐ Bath and North East Somerset (4)
- ☐ Bedford (5)
- ☐ Bexley (6)
- ☐ BFPO Overseas Establishments (7)
- ☐ Birmingham (8)
- ☐ Blackburn with Darwen (9)
- ☐ Blackpool (10)
- ☐ Bolton (11)
- ☐ Bournemouth, Christchurch and Poole (12)
- ☐ Bracknell Forest (13)
- ☐ Bradford (14)
- ☐ Brent (15)
- ☐ Brighton and Hove (16)
- ☐ Bristol, City of (17)
- ☐ Bromley (18)
- ☐ Buckinghamshire (19)
- ☐ Bury (20)
- ☐ Calderdale (21)
- ☐ Cambridgeshire (22)
- ☐ Camden (23)
- ☐ Central Bedfordshire (24)
- ☐ Cheshire East (25)
- ☐ Cheshire West and Chester (26)
- ☐ City of London (27)
- ☐ Cornwall (28)
- ☐ County Durham (29)
- ☐ Coventry (30)
- ☐ Croydon (31)
- ☐ Cumbria (32)
- ☐ Darlington (33)
- ☐ Derby (34)
- ☐ Derbyshire (35)
- ☐ Devon (36)
- ☐ Doncaster (37)
- ☐ Dorset (38)
- ☐ Dudley (39)
- ☐ Ealing (40)
- ☐ East Riding of Yorkshire (41)
- ☐ East Sussex (42)
- ☐ Enfield (43)
- ☐ Essex (44)
- ☐ Fieldwork Overseas Establishments (45)

- Gateshead (46)
- Gloucestershire (47)
- Greenwich (48)
- Hackney (49)
- Halton (50)
- Hammersmith and Fulham (51)
- Hampshire (52)
- Haringey (53)
- Harrow (54)
- Hartlepool (55)
- Havering (56)
- Herefordshire, County of (57)
- Hertfordshire (58)
- Hillingdon (59)
- Hounslow (60)
- Isle of Wight (61)
- Islington (62)
- Kensington and Chelsea (63)
- Kent (64)
- Kingston upon Hull, City of (65)
- Kingston upon Thames (66)
- Kirklees (67)
- Knowsley (68)
- Lambeth (69)
- Lancashire (70)
- Leeds (71)
- Leicester (72)
- Leicestershire (73)
- Lewisham (74)
- Lincolnshire (75)
- Liverpool (76)
- Luton (77)
- Manchester (78)
- Medway (79)
- Merton (80)
- Middlesbrough (81)
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- North Lincolnshire (87)
- North Northamptonshire (88)
- North Somerset (89)
- North Tyneside (90)
- North Yorkshire (91)
- Northumberland (92)
- Nottingham (93)
- Nottinghamshire (94)
- Oldham (95)
- Oxfordshire (96)
- Peterborough (97)
- Plymouth (98)
- Portsmouth (99)
- Pre-LGR 2019 Bournemouth (100)

- Pre-LGR 2019 Dorset (101)
- Pre-LGR 2019 Poole (102)
- Pre-LGR 2021 Northamptonshire (103)
- Reading (104)
- Redbridge (105)
- Redcar and Cleveland (106)
- Richmond upon Thames (107)
- Rochdale (108)
- Rotherham (109)
- Rutland (110)
- Salford (111)
- Sandwell (112)
- Sefton (113)
- Sheffield (114)
- Shropshire (115)
- Slough (116)
- Solihull (117)
- Somerset (118)
- South Gloucestershire (119)
- South Tyneside (120)
- Southampton (121)
- Southend-on-Sea (122)
- Southwark (123)
- St. Helens (124)
- Staffordshire (125)
- Stockport (126)
- Stockton-on-Tees (127)
- Stoke-on-Trent (128)
- Suffolk (129)
- Sunderland (130)
- Surrey (131)
- Sutton (132)
- Swindon (133)
- Tameside (134)
- Telford and Wrekin (135)
- Thurrock (136)
- Torbay (137)
- Tower Hamlets (138)
- Trafford (139)
- Wakefield (140)
- Walsall (141)
- Waltham Forest (142)
- Wandsworth (143)
- Warrington (144)
- Warwickshire (145)
- West Berkshire (146)
- West Northamptonshire (147)
- West Sussex (148)
- Westminster (149)
- Wigan (150)
- Wiltshire (151)
- Windsor and Maidenhead (152)
- Wirral (153)
- Wokingham (154)
- Wolverhampton (155)

- Worcestershire (156)
- York (157)

Display This Question:

If Which phase is your school? = Nursery

Q17 How many pupils are currently enrolled in your school/nursery?

- Up to 30 (1)
- 31 - 50 (2)
- 51 + (3)

Display This Question:

If Which phase is your school? = Primary (Including middle, deemed primary)

Q18 How many pupils are currently enrolled in your primary school?

- Up to 99 (1)
- 100 - 399 (2)
- 400 - 799 (3)
- 800 - 1199 (4)
- 1200 + (5)

Display This Question:

If Which phase is your school? = Secondary (Including middle, deemed secondary)

Q19 How many pupils are currently enrolled in your secondary school?

- Up to 99 (1)
- 100 - 499 (2)
- 500 - 999 (3)
- 1000 - 1499 (4)
- 1500 + (5)

Display This Question:

If Which phase is your school? = Further Education/Post-16

Q20 How many pupils are currently enrolled in your school/college?

- Up to 99 (1)
- 100 - 499 (2)

- 500 - 999 (3)
- 1000 - 1499 (4)
- 1500 + (5)

Display This Question:

If Do you work in a single school or across multiple schools? = Multiple schools

Q21 How many schools are in your trust, federation or multi-academy trust?

- 2 - 9 (1)
- 10 - 19 (2)
- 20 - 29 (3)
- 30 - 39 (4)
- 40 + (5)

Display This Question:

If Which phase is your school? = Nursery

Q22 How would you describe the level of deprivation in the catchment area of your school/nursery?

- Very deprived (6)
- Deprived (7)
- Somewhat deprived (12)
- Not very deprived (8)
- Not at all deprived (10)

Display This Question:

If Which phase is your school? = Primary (Including middle, deemed primary)

Q23 What percentage of pupils in your primary school are currently eligible for pupil premium?

- 0 - 9% (1)
- 10 - 19% (3)
- 20 - 29% (5)
- 30 - 49% (6)
- 50% + (4)

Display This Question:

If Which phase is your school? = Secondary (Including middle, deemed secondary)

Q24 What percentage of pupils in your secondary school are currently eligible for pupil premium?

- 1 - 9% (1)
- 10 - 19% (2)
- 20 - 39% (3)
- 40 - 59% (4)
- 60% + (5)

Display This Question:

If Which phase is your school? = Further Education/Post-16

Q25 How would you describe the level of deprivation in the catchment area of your school/college?

- Very deprived (1)
- Deprived (4)
- Somewhat deprived (5)
- Not very deprived (2)
- Not at all deprived (3)

Display This Question:

If Do you work in a single school or across multiple schools? = A single school

Q26 What is the current Ofsted rating of your school?

- Inadequate (1)
- Requires Improvement (2)
- Good (3)
- Outstanding (4)
- Not relevant (5)

End of Block: About Your School

Start of Block: About a new approach, programme, intervention or strategy

Q27

Section 2 of 4: Your experience of introducing an approach in your school

Please think about a new approach (i.e. practice, programme, intervention or strategy) that has been introduced in your school/s in the last three academic years aiming to improve pupil outcomes and answer the following questions about introducing this approach. This approach should not be directly related to COVID-19.

Please note that we are not evaluating you or your work. We would be equally interested to

hear about an example that was challenging or less successful, as well as those that were considered a success.

Examples of approaches could include whole school strategies (e.g. behaviour policy), new or revised teaching techniques (e.g. feedback strategies), specific programmes (e.g. phonics programme), individual/small group targeted interventions (e.g. reading intervention), or a new curriculum (e.g. PSHE curriculum).

Q28 What improvement need were you addressing? (Examples could include literacy, homework, behaviour, bullying)?

Please write the name and a brief description of what you were trying to address in the box below.

Q29 What approach did you introduce to tackle this area of improvement?

Please write the name and a brief description of the approach you selected in the box below.

Display This Question:

If Do you work in a single school or across multiple schools? = Multiple schools

Q30 Did you introduce this approach in one school or more than one school?

- One school (1)
- Whole trust/federation (2)
- Other (please specify the specific number of schools in the box immediately below) (3)

Display This Question:

If Did you introduce this approach in one school or more than one school? = One school

Q31 What phase is the school you introduced this approach to?

- ☐ Nursery (1)
 - ☐ Primary (Including middle, deemed primary) (2)
 - ☐ Secondary (Including middle, deemed secondary) (9)
 - ☐ Further Education/Post-16 (5)
 - ☐ Other (please specify the age range of your school in the box immediately below) (6)
-

Display This Question:

If What phase is the school you introduced this approach to? = Primary (Including middle, deemed primary)

Q32 How many pupils are currently enrolled in this primary school?

- ☐ Up to 99 (1)
- ☐ 100 - 399 (2)
- ☐ 400 - 799 (3)
- ☐ 800 - 1199 (4)
- ☐ 1200 + (5)

Display This Question:

If What phase is the school you introduced this approach to? = Secondary (Including middle, deemed secondary)

Q33 How many pupils are currently enrolled in this secondary school?

- ☐ Up to 99 (1)
- ☐ 100 - 499 (2)
- ☐ 500 - 999 (3)
- ☐ 1000 - 1499 (4)
- ☐ 1500 + (5)

Display This Question:

If Did you introduce this approach in one school or more than one school? = One school

Q34 What percentage of pupils in this primary school are currently eligible for pupil premium?

- 0 - 9% (1)
- 10 - 19% (3)
- 20 - 29% (5)
- 30 - 49% (6)
- 50% + (4)

Display This Question:

If Which phase is your school? = Secondary (Including middle, deemed secondary)

Q35 What percentage of pupils in this secondary school are currently eligible for pupil premium?

- 1 - 9% (1)
- 10 - 19% (2)
- 20 - 39% (3)
- 40 - 59% (4)
- 60% + (5)

Display This Question:

If Did you introduce this approach in one school or more than one school? = One school

Q36 What is the current Ofsted rating of this school?

- Inadequate (1)
- Requires Improvement (2)
- Good (3)
- Outstanding (4)
- Not relevant (5)

Q37 Which of the following sources of information did you consult when identifying the school improvement need or deciding an approach to introduce to the school? Please select all that apply.

- Pupil attainment data (1)
- Other pupil data (2)
- External organisations (e.g. local authority, subject associations, Professional development providers, DfE, Ofsted) (3)
- External policy (4)
- School policy or vision (5)
- Articles, reports, books or summaries based on academic research (18)
- Articles, reports, books or summaries based on teacher experience (19)
- Information gathered through professional development (20)
- Online evidence platforms or databases (e.g. Chartered College of Teaching, Education Endowment Foundation resources) (21)
- Guidance from exam boards (23)

- Consultation with a range of school stakeholders (24)
- Colleagues within my own school or trust (25)
- Colleagues in other schools (26)

Q38 Please think about when you or your school were identifying the improvement need and deciding what approach to introduce. How much do you agree with the following statements?

	Strongly Disagree (6)	Disagree (7)	Agree (8)	Strongly Agree (9)	Not Applicable (10)
The change was agreed by staff as a key priority for school improvement (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evidence that the approach had positive outcomes in a similar context was important (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was important that the approach represented good value for money (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We assessed how well the approach would fit our school and any changes that were needed to accommodate it (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We explored different approaches to find the most feasible and promising one (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We ensured that staff perceived the approach as a better option than established practice (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was important that external partners, parents and carers supported the approach (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research evidence supporting the approach was	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

available and clear
(17)

The approach was
mandated (e.g.
Ofsted, whole trust
approach, practice
introduced across
authority/nationally)
(18)

○ ○ ○ ○ ○

Q39 Optional: Please tell us anything else that stood out as particularly helpful or particularly challenging when determining which new approach to introduce:

Q40 Please think about when you were planning how to introduce the particular approach selected.

Q41

Did your school create a structured plan for introducing the approach?

- Yes (1)
- No (2)

Display This Question:

If Did your school create a structured plan for introducing the approach? = Yes

Q42 If you would be happy to share this plan and have a link to share it, please paste the link here:

Q43 How much do you agree with the following statements?

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Not Applicable (5)
Planning was the responsibility of the senior leadership team (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students and parents were informed and prepared about the approach (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We worked with external organisations (e.g. other schools, the developers of the approach, staff who support schools) to prepare for introducing the approach (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The approach had a clear champion, who was responsible for planning, maintaining resources and overseeing the introduction of this change (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff delivering the approach received effective training (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Necessary resources including time,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

staff and funding were identified (18)

We had to revise the plans for introducing the approach because of the impact of COVID-19 (19)

☐ ☐ ☐ ☐ ☐

Q44 Optional: Please tell us anything not covered in the questions above that was particularly helpful or challenging when preparing for this new approach to be introduced to your school:

Q45 Please think about when you first started to introduce the approach in practice. How much do you agree with the following statements?

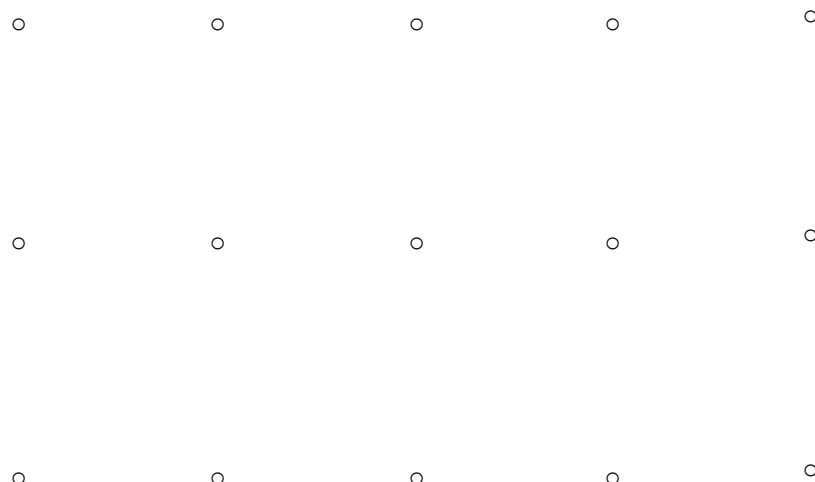
	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Not Applicable (5)
Staff felt trusted to try out the approach and make mistakes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advice and support was available for staff as they started to deliver the approach (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff adapted the approach to suit their subject/phase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

and pupils
(14)

We conducted
a smaller pilot
of the approach
before
introducing it
more fully (15)

Staff
introducing the
approach
understood and
valued its goals
(17)

Staff felt like
they did not
have enough
time to prepare
for and deliver
the approach
(18)



Q46 Optional: Please tell us a feature of your school context that stood out as particularly helpful or particularly challenging when introducing this strategy into practice:

Q47 Please think about steps you took to monitor and evaluate the impact of the approach. How much do you agree with the following?

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Not Applicable (5)
Staff knew what data to collect in order to monitor impact of the new approach (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feedback from students and families was also used to evaluate the new approach (16)

☐ ☐ ☐ ☐ ☐

It was difficult to monitor the effectiveness of the approach in practice (17)

☐ ☐ ☐ ☐ ☐

Reflection, feedback and monitoring changed subsequent delivery of the approach (19)

☐ ☐ ☐ ☐ ☐

Staff were encouraged to feedback concerns that arose in practice (20)

☐ ☐ ☐ ☐ ☐

The approach was successful in its aims (21)

☐ ☐ ☐ ☐ ☐

Q48 Please briefly tell us how you measured the success of the approach, including any relevant measures of the delivery of the approach as well as impact on pupils:

Q49 **Optional:** Please tell us about a feature of the approach that stood out as particularly helpful or particularly challenging in your efforts to monitor and evaluate its impact:

Q50 Please tell us about how the approach is being used now and if and how you plan to use it in the future.

Q51 Are you still using the approach?

- ☐ Yes (1)
- ☐ No (2)

Display This Question:

If Are you still using the approach? = No

Q52 Please briefly let us know the reasons why the approach is no longer used:

Display This Question:

If Are you still using the approach? = Yes

Q53 How much do you agree with the following statements about the approach?

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)	Not Applicable (5)
The approach has become part of usual practice at the school/s (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Delivery of the approach is resilient to any new practice or demands that might occur (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The approach has been rolled out more widely than at first (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It has been hard to sustain the approach (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Over time the approach has been further adapted to our school context (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support for staff delivering the approach has been necessary to continue (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q54 Optional: Please tell us an important feature of your school context that stands out as particularly helpful or particularly challenging in sustaining use of this approach:

Display This Question:

If Are you still using the approach? = Yes

Q55 Optional: You are still using the approach, which is useful to know. Are there any other approaches you have attempted to introduce in your school over recent years that have not been as successful or are no longer being used? If so, could you briefly tell us what the approach was and up to three reasons why that approach was not sustained?

End of Block: About a new approach, programme, intervention or strategy

Start of Block: About sources of support

Q56

Section 3 of 4

Thank you for telling us about your example of an approach introduced to address an improvement need. You have now completed the main section of the survey. There are two short sections left to complete.

In this section we ask about support for leading change in schools more generally.

Q57 Where would you value further guidance for school leaders in relation to introducing new approaches in schools? Please select any of the following areas where you think there is a need for more guidance:

- Identifying and agreeing with your school community a key priority that is amenable to change (19)
- Exploring and choosing amongst approaches (20)
- Examining the fit and practicality for school context (21)
- Developing a clear, logical and well specified plan for introduction and delivery of new approaches (22)
- Communicating the rationale and key details of new approaches to all those impacted (staff, pupils, families, other stakeholders) (23)
- Selecting strategies that support introducing new approaches (24)
- Planning for sustaining the approach from the outset (25)
- Assessing the readiness of the school and individuals to deliver new approaches (26)
- Supporting staff to address and solve problems when delivering new approaches (27)
- Identifying the right outcomes to monitor both delivery and impact of approaches (28)
- Developing relationships with academic and wider networks who can provide support? (e.g. funding and training opportunities) (29)
- Embedding a school culture that supports improvement (31)



Q58 We are interested in some of the terminology associated with the topic of this survey.

What does the term “implementation” mean to you? Please select up to 5 of the following definitions taken from policy, guidance and theory that best match your view of the term:

- The process of putting a decision or plan into practice (1)
- What organisations do to change and be more effective (2)
- The way in which the curriculum is taught at subject and classroom level (3)
- A series of stages relating to thinking about, preparing for, delivering, and sustaining change (4)
- The transition from evidence about an approach to use in real life settings (5)
- Methods to promote the systematic uptake of research findings and evidence-based practices into routine practice (6)
- When an innovation is put into practice (7)
- Making and acting on evidence-informed decisions (8)
- How organisations enact or deal with any improvement processes (9)
- Adapting new policies and processes to suit different contexts (school, classroom, individual/groups of learners) (10)

Display This Question:

If Which of the following sources of information did you consult when identifying the school improve... = Online evidence platforms or databases (e.g. Chartered College of Teaching, Education Endowment Foundation resources)

Q59 Have you read the EEF Guidance Report ‘Putting Evidence to Work: A School’s Guide to Implementation?

- Yes (1)
- No (2)

Display This Question:

If Have you read the EEF Guidance Report ‘Putting Evidence to Work: A School’s Guide to Implementation... = Yes

Q60 **Optional:** How useful did you find each section of the guidance report?

Here is the link if you wish to remind yourself, but please feel free to answer in terms of what you recall (<https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/implementation>)

	Not useful (1)	Limited use (2)	Useful (3)	Very useful (4)	Have not read/do not recall (5)
Section 1 and 2: foundations for good implementation (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Section 3: explore: Define the problem you want to solve and identify appropriate programmes or practices to implement. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Section 4: prepare: Create a clear implementation plan, judge the readiness of the school to deliver that plan, then prepare staff and resources. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Section 5: deliver: Support staff, monitor progress, solve problems, and adapt strategies as the approach is used for the first time. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Section 6: sustain: Plan for sustaining and scaling an intervention from the outset and continuously acknowledge and nurture its use. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you read the EEF Guidance Report 'Putting Evidence to Work: A School's Guide to Implementation... = Yes

Q61 **Optional:** How useful did you find these features of the guidance report and additional resources?

Here is the link if you wish to remind yourself, but please feel free to answer in terms of what you recall (<https://educationendowmentfoundation.org.uk/education-evidence/guidance-reports/implementation>)

	Not useful (1)	Limited use (2)	Useful (3)	Very useful (4)	Have not read/do not recall (5)
Implementation process diagram (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
End of section checklist questions (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Case studies (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summary of recommendations poster (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementation plan template (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Example of implementation plans (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Active ingredients summary (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gathering and interpreting data summary (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Master checklist (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Have you read the EEF Guidance Report 'Putting Evidence to Work: A School's Guide to Implementation...' = Yes

Q62 Optional: Please provide any further comments on the EEF Guidance Report 'Putting Evidence to Work: A School's Guide to Implementation':

End of Block: About sources of support

Start of Block: contact info for summary of results and interview data collection

Q63

Section 4 of 4

Thanks for your responses so far. This final section asks if you would like to provide contact details.

Survey responses from a variety of schools will help us understand the range of different approaches introduced and challenges experienced.

It is also really important to find out more detail from some schools to get a deeper understanding of their experiences to help inform guidance for schools. Therefore, we aim to hold interviews online or by phone with some individuals and would really appreciate it if you would consider this.

Would you like to leave your contact details to find out more about interviews or for any of the following reasons? Please select all that apply.

Your contact details will not be linked to survey responses.

- I would like to receive information about participating in an online/telephone interview (This does not mean you are signing up to take part, just that you would be interested in further information) (1)
- I would like to receive a summary of this study's findings (2)
- I would like to leave my details in order to remove my responses at a later date (3)

Display This Question:

If Section 4 of 4 Thanks for your responses so far. This final section asks if you would like to p... = I would like to receive information about participating in an online/telephone interview (This does not mean you are signing up to take part, just that you would be interested in further information)

Or Section 4 of 4 Thanks for your responses so far. This final section asks if you would like to p... = I would like to receive a summary of this study's findings

Or Section 4 of 4 Thanks for your responses so far. This final section asks if you would like to p... = I would like to leave my details in order to remove my responses at a later date

Q64

Please leave your contact details below. These details will not be linked to your survey responses.

- Name (1) _____
- Email Address (2) _____
- Contact Number (3) _____

End of Block: contact info for summary of results and interview data collection

Appendix 9 – Topic guide interview 1 WP2

EEF Imp Work Package 2: First Interview Topic Guide

This document includes full details of key topics, advice and introduction and closing for interviews.

Introduction

Introduce researcher, study topic, aims of interview [deeper understanding of their experiences introducing an approach into practice in the last few years], purpose [we want review of research evidence and data collection from schools to inform guidance],

At end

Thank for time and reiterate confidentiality and anonymity (we will change any names, including of school).

<p>1. Why?</p> <p>Aim: Build rapport and thank for survey, clarify their interest in topic and if this is the major school improvement area.</p> <p>Why interested in participating survey and interview?</p> <p>Why tell us about that [improvement need and approach Q28 and Q29]</p>	<p>2. Improvement need in their context?</p> <p>Aim: Understand why that improvement need was a priority</p> <p>How did they identify [Q28 improvement need as a key priority that could be changed?</p> <p>Whose priority was it [individual or External]?</p> <p>What was the issue with current practice?</p> <p>To what extent did influences out of school set the priority? Q38</p>
<p>3. The approach?</p> <p>Aim: Understand the approach and why it was selected</p> <p>Describe what it looks like in practice?</p> <p>May need to pin down to one aspect, intervention.</p> <p>Who helped select the specific approach?</p> <p>What made it the right approach? Q38</p> <p>How did they know it was likely to work?</p> <p>Evidence it works. Q38</p> <p>Resources needed? Q43</p>	<p>4. Fit and readiness?</p> <p>Aim: Understand how approach fits their school and anything done to aid this (readiness).</p> <p>How does the approach fit with school?</p> <p>Values, vision, context of school</p> <p>Was approach adapted for the school?</p> <p>How did you know school was ready for that approach?</p> <p>How did school community view/buy-in the approach?</p> <p>Change to previous practice and workload?</p> <p>Staff readiness</p> <p>Staff motivation, capability, capacity</p>

<p>5. Preparation?</p> <p>Aim: Understand what was done to prepare ahead of introducing the approach</p> <p>How did staff involved get ready?</p> <p>Understanding the approach</p> <p>Professional Development Q43</p> <p>Core components identified</p> <p>What planning [refer to Q41-42]</p> <p>Does plan include who, what, when?</p> <p>Strategies or tools use to help give the approach the best chance of success.</p> <p>Time and funding needed identified</p>	<p>6. Leading the change?</p> <p>Aim: If interviewing Head or implementation lead, their role and work with colleagues.</p> <p>Their role as Head or SLT?</p> <p>Communication to school community?</p> <p>Getting buy in?</p> <p>Their experience or training?</p> <p>Who was involved in leading and preparing?</p> <p>Their Roles? Selection? Collaboration?</p> <p>Team versus champion? Q43</p>
<p>7. Introducing the approach?</p> <p>Aim: Understand experience and any challenges and changes when first introduced approach.</p> <p>How did it go when first introducing?</p> <p>Adapted approach, differences across school? Q45</p> <p>What has helped sustain the approach in practice [if relevant Q51]? Q53</p> <p>COVID-19 impact Q43</p>	<p>8. Monitoring and evaluation?</p> <p>Aim: Identify how impact of approach was measured</p> <p>How was impact of approach measured? Q48</p> <p>Data versus reflection? Q47</p> <p>Changes made and why?</p> <p>How did plan change?</p> <p>What is next for the approach?</p>
<p>9. Broader impacts?</p> <p>Aim: Probe whether implementation of this approach impacts implementation of others</p> <p>Has or will the experience inform future change?</p> <p>What transferable things have they or community learnt?</p> <p>Are staff ready to implement new ideas?</p> <p>Does it impact school climate?</p>	<p>10. Context?</p> <p>Aim: Find out about any other features of school and its context that impact the experience</p> <p>How school context shaped the decisions and actions? Q46 no answer,54 No answer</p> <p>What is particular to their context?</p> <p>What has been challenging?</p>
<p>11. Implementation support?</p> <p>Aim: Find out about what supported the implementation</p> <p>What advice, support, training, and experience has helped with your implementation work?</p> <p>What is missing for schools/leaders? Q57</p> <p>EEF guidance report use/value? Q59-62</p>	<p>12. De-implementation</p> <p>Aim: Find out about implementation that has been less successful</p> <p>This approach has clearly made a difference, are there any examples of approaches tried that less successful? Q55</p> <p>Why that approach was not sustained Q55</p> <p>Challenges for that approach? How they knew to stop?</p>

Appendix 10 – Topic guide interview 2 WP2

EEF Imp Work Package 2: Second Interview Topic Guide

This document includes full details of key topics, advice and introduction and closing for second round interviews.

Background information

What changes have happened in relation to the approach discussed in practice

Follow up on important ideas from first interview

More general questions reflective of our research findings to date

Introduction

Re-introduce researcher, study topic, purpose of re-interviewing several participants, why we approached them, aims of interview [the three sections], purpose [we want review of research evidence and data collection from schools to inform guidance].

Section 1

Can you tell me about any changes to the delivery of the approach now compared to then?

How has the school context changed since then?

Pandemic, time of year, competing priorities, staff changes?

Prompts:

What, if anything, has helped to sustain the approach?

Have the views of staff or pupils about the approach changed over time, if so, how?

Do you have any more data on the impact of the approach?

Have any changes/adaptations to approach been made? If so in what way?

Section 2

Three to five questions that want to ask more about.

e.g. last time you mentioned X, this was really interesting, can you tell me more about this?

You mentioned X, which resonates with Y in the literature, can you tell me more about this?

You mentioned X and others also mentioned Y as similar, do you think this fits with you experience?

Section 3

What was the foundation for getting the implementation of this approach right? What did you have in place already or was key to facilitating it?

Can you tell me more about a specific area of implementation?

What perceptions or attitudes play a role (either in your own individual experiences or your experiences as part of implementing change across the school more broadly)?

Can you tell me about how? in your school (or for specific intervention)? (This might be in terms of preparation or applying it in practise)

Can you think of a different approach that has been put in place in the school? What was unique to implementing the approach we have been discussing? What was shared?

Section 4

A tension in the literature is between implementation teams and champions [explain both and pros and cons] Which of these best fits, any thoughts on getting teams right.

A tension in the literature is between putting in place an approach with fidelity and adapting it for context. Any thoughts on getting this right?

Another tension in the literature is around shared decision making and the challenges around this practice. What are your own experiences around this?

How has pandemic impacted the kind of things discussed? Remote working partially sustained? More open discussion of workload and wellbeing?

Probe work practices. Pressures.

Section 5

Anything else to add that not covered.

Any questions for us.

Reiterate confidentiality and anonymity.

Appendix 11 – Interview study information WP2

School Improvement Practices Interview - Information

Thank you for your interest in taking part in an interview for the Exeter University Graduate School of Education, regarding school improvement practices. This form is to let you know: - What the research is about - What taking part will involve - What will be done with the information you share Please take time to consider the information carefully and to ask the research team any questions you may have. Please use this form to provide consent if you do wish to take part.

* Required

A) Why we are doing this research

We are inviting you to take part in an interview as you recently completed our 'School Improvement Practices Survey: What Works, When and for Who?'.

We would like to interview around 25 different schools in England, to ask more detailed questions about implementing new approaches to improve outcomes for students. We welcome any member of staff in your school or college who has responsibility for introducing an approach into practice in the last few years. You can invite more than one member of staff to join the interview, or we can hold separate interviews. We will also ask about areas of support and guidance to help schools introduce new approaches more generally. We would like to hear from some schools on two occasions to learn about changes that may have occurred by the end of Spring Term 2022. We will ask you about this at the end of the interview.

By sharing your knowledge and experiences, the interview will help us build on current theoretical understanding of how schools select, prepare, introduce, and sustain new approaches in their practice.

What will happen afterwards.

You can opt to receive a summary of our findings at the end of the study, as well as be notified about the publication of any reports or practitioner guidance.

1. Do you think you understand what will happen in this research and why you have been asked to take part?

* Yes, Not sure

B) What will happen if I take part?

If you choose to take part, a researcher will contact you to arrange a 50–60-minute interview to take place at a time convenient to you, via Microsoft Teams, Zoom or phone call. If you would like another member of staff to join the interview too, they will need to read and complete this information and consent form before taking part. You do not need to do anything to prepare for the interview, but staff completing the interview may wish to reflect on the actions taken to implement the approach you will talk to us about.

Benefits of taking part.

We hope taking part in this interview is a useful activity to reflect on school improvement. There is unlikely to be any other direct or personal benefit to you in taking part. Responses will be used to inform guidance for educators.

Possible risks of taking part.

There are no risks to taking part in this research greater than what you may encounter daily in your normal life. If you feel any discomfort or doubt about taking part, you can stop at any time before or during the interview.

2. Do you think you understand what is involved if you take part?

* Yes, Not Sure

3. Do you think you understand the possible benefits, disadvantages, and risks of taking part?

* Yes, Not sure

C. What happens next?

Will you record the interview?

It will be necessary for us to record the interview questions and responses, so that these can be transcribed. We would like to conduct the interview via video call, as this will help the conversation compared to an audio call only. Only the audio data will be reviewed to transcribe the interview dialogue as text. Once we have transcribed the interview, we will delete the recording. You will have the option to receive a copy of the transcript, and to comment or refine your responses if you wish.

Just before the interview questions start, we will double-check that you are happy for the interview to be recorded. We ask that you sit in a private area or apply a blurred filter or false background to your camera if you choose to keep it on. This will help to ensure that we do not capture video data of anyone who has not consented to take part in the research. If you need to answer the door in the interview, we will also stop or pause the recording and ask that you mute your microphone.

What will be done with my data?

The data we collect from you will be stored securely and treated as confidential. We will transcribe your interview recording and then delete the recording. In the transcription, we will use a pseudonym instead of your real name, so it will not be possible to identify you or your colleagues in the data we publish. We will keep your personal details until the end of the study to contact you about the study (to arrange the interview and invite you to take part in an optional second interview). Your personal data, including information provided in this form, will be stored separately to your interview data and we will use an anonymous code to link them.

What happens if I want to withdraw during or after the interview?

You can stop taking part at any time without giving a reason. If you would like to withdraw during the interview, we will stop the interview and recording immediately and check whether you would like to withdraw all data provided up to that point, or if you would like the captured data to be used. After the interview, you can contact us until April 2022 to withdraw the data you have provided. It will not be possible to withdraw your data after April 2022, as we will not retain your personal information and your transcript will be stored using a pseudonym.

Will I be paid to take part?

Taking part in this study is voluntary and participants will not be paid for taking part.

4. Do you think you understand how the information you provide will be used?

*Yes, Not Sure

5. Do you think you understand your rights and what will happen if you don't want to carry on with the study?

*Yes, Not sure

6. Do you understand the information about payment? *Yes, Not sure

Appendix 12 – Search strategy WP3

Database: APA PsycInfo <1946 to November 11, 2021>

Search Strategy:

-
- 1 implementation.ti,id. (45276)
 - 2 (implement* adj3 change).ti,ab. (3103)
 - 3 (implement* adj2 best practice).ti,ab. (603)
 - 4 (implement* adj2 evidence based).ti,ab. (4871)
 - 5 (implementation adj3 dissemination).ab. (1703)
 - 6 (dissemination or disseminating).ti,ab. (75052)
 - 7 (manag* adj2 change).ti,ab. (4885)
 - 8 (behavio* adj2 change).ti,ab. (27256)
 - 9 (knowledge adj2 (translat* or transfer or sharing or mobil*)).ti,ab. (9918)
 - 10 or/1-9 (163898)
 - 11 process evaluation.ti,ab. (4178)
 - 12 "barriers and facilitators".ti,ab. (8310)
 - 13 (barriers and facilitators).ti. (3654)
 - 14 "barriers and enablers".ti,ab. (1501)
 - 15 (barriers adj2 implementation).ti,ab. (3225)
 - 16 (barriers adj2 adoption).ti,ab. (635)
 - 17 (Challenges adj2 implementation).ti,ab. (2208)
 - 18 or/11-17 (19891)
 - 19 feasib*.ti,ab. (361745)
 - 20 sustainab*.ti,ab. (92893)
 - 21 adherence.ti,ab. (134181)
 - 22 appropriateness.ti,ab. (22704)
 - 23 compatibility.ti,ab. (31595)
 - 24 fidelity.ti,ab. (31676)
 - 25 utility.ti,ab. (226554)
 - 26 dosage.ti,ab. (140579)
 - 27 (compliance or compliancy).ti,ab. (125635)
 - 28 (acceptability or acceptance).ti,ab. (116712)
 - 29 adoption.ti,ab. (59070)
 - 30 engagement.ti,ab. (78578)
 - 31 successful implementation.ti,ab. (7927)
 - 32 (failed adj2 implement*).ti,ab. (94)
 - 33 poor implementation.ti,ab. (246)
 - 34 responsiveness.ti,ab. (106862)
 - 35 transferability.ti,ab. (5083)
 - 36 penetration.ti,ab. (76506)
 - 37 practicability.ti,ab. (4644)
 - 38 integration.ti,ab. (191058)
 - 39 adaptability.ti,ab. (13197)
 - 40 cost benefit.ti,ab. (10844)
 - 41 cost effectiveness.ti,ab. (65154)
 - 42 or/19-41 (1740383)
 - 43 Schools/ (44789)
 - 44 school*.ti,ab. (307568)
 - 45 pupil*.ti,ab. (31301)
 - 46 classroom*.ti,ab. (19630)
 - 47 teacher*.ti,ab. (49103)
 - 48 or/43-47 (374991)
 - 49 Leadership/ (44385)
 - 50 leadership.ti,ab. (41522)

51 professional development.ti,ab. (10567)
 52 champion*.ti,ab. (8191)
 53 expert*.ti,ab. (223118)
 54 early adopter*.ti,ab. (855)
 55 opinion leader*.ti,ab. (1604)
 56 multidisciplinary team*.ti,ab. (20720)
 57 implementation team.ti,ab. (206)
 58 partnership*.ti,ab. (40200)
 59 advisory board*.ti,ab. (2285)
 60 support structure*.ti,ab. (1395)
 61 coalition*.ti,ab. (6604)
 62 reward scheme*.ti,ab. (18)
 63 incentiv*.ti,ab. (34574)
 64 (readiness adj2 change).ti,ab. (1793)
 65 (staff adj2 training).ti,ab. (5585)
 66 (implementation adj5 training).ti,ab. (4075)
 67 (implementation adj2 support).ti,ab. (2978)
 68 (teacher* adj2 training).ti,ab. (1689)
 69 (teacher adj2 coaching).ti,ab. (15)
 70 (skills adj2 training).ti,ab. (8864)
 71 (teachers adj trained).ti,ab. (43)
 72 technical assistan*.ti,ab. (2516)
 73 computer assisted instruction/ (12260)
 74 (training adj program*).ti,ab. (47258)
 75 peer assisted learning.ti,ab. (266)
 76 training intervention.ti,ab. (2698)
 77 staff education.ti,ab. (1876)
 78 teacher education.ti,ab. (408)
 79 (CPD or professional development).ti,ab. (15549)
 80 reminder*.ti,ab. (14215)
 81 (audit adj2 feedback).ti,ab. (1590)
 82 (monitor* adj2 feedback).ti,ab. (960)
 83 (performance adj2 feedback).ti,ab. (2185)
 84 (performance adj2 evaluat*).ti,ab. (40825)
 85 (performance adj2 monitor*).ti,ab. (4162)
 86 (audit adj2 evaluat*).ti,ab. (384)
 87 (audit adj2 monitor*).ti,ab. (122)
 88 (staff adj2 feedback).ti,ab. (429)
 89 (staff adj2 evaluat*).ti,ab. (948)
 90 (staff adj2 monitor*).ti,ab. (389)
 91 teacher consultation*.ti,ab. (29)
 92 ((family or pupil or student) adj2 feedback).ti,ab. (1141)
 93 stakeholder*.ti,ab. (49990)
 94 (progress adj monitoring).ti,ab. (272)
 95 (quality adj monitoring).ti,ab. (3460)
 96 (practi*e adj supervision).ti,ab. (35)
 97 (implement* adj2 strateg*).ti,ab. (15460)
 98 (dissemination adj2 strateg*).ti,ab. (717)
 99 (environment* adj2 strateg*).ti,ab. (2142)
 100 tailor strateg*.ti,ab. (72)
 101 (capacity adj2 build*).ti,ab. (8132)
 102 coalition.ti,ab. (5049)
 103 teacher supervision.ti,ab. (22)
 104 local coordinat*.ti,ab. (720)
 105 campaign*.ti,ab. (49021)

106 (change adj2 culture).ti,ab. (1674)
107 (improv* adj culture).ti,ab. (477)
108 (change adj2 environment).ti,ab. (954)
109 (change adj2 community).ti,ab. (1384)
110 (change adj2 standards).ti,ab. (106)
111 (funding adj3 change).ti,ab. (135)
112 (mandate adj2 change).ti,ab. (49)
113 needs assessment.ti,ab. (6620)
114 local consensus.ti,ab. (107)
115 blueprint.ti,ab. (4822)
116 implementation plan*.ti,ab. (1109)
117 (implementation adj2 strategy).ti,ab. (2011)
118 (framework and implementation).ti,ab. (22404)
119 "scale up".ti,ab. (13562)
120 "scaling up".ti,ab. (5817)
121 data warehousing.ti,ab. (156)
122 or/49-121 (686210)
123 10 and 42 and 48 and 122 (1059)
124 18 and 42 and 48 (719)
125 123 or 124 (1635)

Appendix 13 – Criteria for WP3 Evidence Map 1 Data extraction

Intervention context Evidence Map rows	Implementation Evidence Map columns	School Phase Evidence Map cells
<p>Intervention Category</p> <ul style="list-style-type: none"> Physical Health Mental Health Teaching and Learning Behaviour Whole School Approach Targeted <p>Pupil Outcomes</p> <ul style="list-style-type: none"> Attainment Physical Health Mental Health Behaviour Speech/language 	<p>Implementation Outcomes</p> <ul style="list-style-type: none"> Fidelity Acceptability Adoption Appropriateness Feasibility Penetration Sustainability Adaptability Economic <p>Implementation Factors</p> <ul style="list-style-type: none"> Leadership School climate and community Readiness Intervention supported by evidence Intervention well specified Intervention fit Intervention adaptation Professional development Implementation teams Implementation roles Buy in Planning Staff capabilities Staff capacity (time) Communication Assessment, monitoring and data Implementation support Incentives De-implementation Scaling up Funding Resources for intervention External support Other implementation strategies 	<ul style="list-style-type: none"> Early Years Primary 11-18 years All

Appendix 14 – Criteria for Evidence Map 2 Data Extraction

Paper details Evidence Map rows	Implementation details Evidence Map columns	Quality Evidence Map cells
<p>Intervention</p> <ul style="list-style-type: none"> Physical Health Mental Health Teaching and Learning Behaviour Whole School Approach Targeted <p>Phase</p> <ul style="list-style-type: none"> Early Years Primary 11 to 18 Multiple <p>Design</p> <ul style="list-style-type: none"> Review Mixed Quantitative Process evaluation Qualitative <p>Outcomes</p> <ul style="list-style-type: none"> Fidelity Acceptability Adoption Appropriateness Feasibility Penetration Sustainability Cost Intervention <p>Country</p> <ul style="list-style-type: none"> USA UK Australia Canada Global Other 	<p>Programme theory contexts</p> <ul style="list-style-type: none"> Enabling Structures Intervention Features Agents for Change <p>Programme theory mechanisms</p> <ul style="list-style-type: none"> Engaging Reflecting Uniting <p>Implementation strategies</p> <ul style="list-style-type: none"> 4. Conduct local needs assessment 1. Assess for readiness and identify barriers and facilitators 23. Conduct local consensus discussions 5. Develop a detailed implementation plan or blueprint 22. Capture and share local knowledge 57. Involve students, family members, and other staff 60. Access new funding 18. Test-drive and select practices 68. Change/alter environment 74. Pruning competing initiatives 26. Identify and prepare champions 28. Inform local opinion leaders 34. Recruit, designate, and train for leadership 48. Create new practice teams 43. Make training dynamic 38. Conduct educational outreach visits 45. Shadow other experts 46. Use train-the-trainer strategies 41. Develop educational materials & 42. Distribute educational materials 51. Improve implementers' buy-in 6. Develop and organise quality monitoring system 7. Develop instruments to monitor and evaluate core components of the innovation/ new practice 39. Conduct ongoing training & 44. Provide ongoing consultation/coaching 14. Provide practice-specific supervision & 30. Model and simulate change 17. Tailor strategies 16. Promote adaptability 53. Remind school personnel 54. Targeting/improving implementer well-being 61. Alter and provide individual- and system-level incentives 8. Obtain and use student and family feedback 12. Facilitation/problem-solving 	<ul style="list-style-type: none"> Study High Study Low Review High Review Low

	<ul style="list-style-type: none"> • 50. Facilitate relay of intervention fidelity and student data to school personnel • 32. Organise school personnel implementation team meetings • 10. Stage implementation scale-up 	
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Appendix 15 – Examples of how synthesis moved from CMOCs for initial programme theory to refined programme theory

Initial PT Domain	CMOC	Evidence	Refined PT CMOC
Readiness	Designated time, space and structure (context) is needed to share knowledge, experiences and views which identifies why priorities have emerged (mechanism), which can lead to appropriateness, feasibility and sustainability of the intervention selected in light of this discussion (outcomes).	Leung (2020), Gorard (2020), Beidas (2012), Maxwell (2019), Hudson (2020), Desimone (2002), Durand (2016)	Supportive <u>enabling structures</u> (context), would trigger opportunities for staff to <u>reflect</u> on implementation (mechanism), which would drive implementation <u>outcomes</u> including fidelity, acceptability and sustainability.
Professional development and support	School level planning and time allocation is needed for the right amount and type of professional development (context), revisiting training over time with support from an intervention expert helps to review and address individual needs (mechanism), this can lead to increased fidelity and sustainability (outcomes).	Evans (2015) Leeman (2018) Desomine (2002) Humphrey (2018) Menzies (2016) Phillips (2020) Ruffini & Miskell (2016) Kurki (2006)	
Communication	An effective communication system is needed for implementation leaders to reach implementers (context), this can allow reminders and support to encourage implementers to self-monitor their delivery (mechanism), which can lead to increased fidelity and sustainability of the intervention (outcomes).	Evans (2015) Hudson (2020) Grossi (2019) Menzies (2016)	
Teams	Time needs to be allocated and communication channels planned and tested (context), so that implementers can share their experiences, support one another and problem-solve intervention delivery (mechanism), this can increase fidelity of intervention delivery and maintain buy-in (outcomes).	Jackson (2018) Evans (2015) Alonge (2020) Micela Leis (2017) Freeman (2013) Robinson (2008) Robinson (2008)	

		Firth (2008) Marrs (2014) Kong (2019) Gagnon (2020)	
Communication	When key individuals are encouraged and empowered to drive change and lead on an intervention being introduced (context), they can communicate to a range of staff how a new practice fits the school and better current practice, giving staff a rationale for the change (mechanism), this increases buy in and adoption (outcomes).	Alonge (2020) Evans (2015) Schelvis (2016) Crane (2021) Meixner (2019) Durand (2016)	Key <u>agents for change</u> who are empowered to lead on implementation (context), can use this position to <u>engage</u> colleagues and other stakeholders impacted by the change in approach (mechanism), this meaningful involvement of others increases implementation <u>outcomes</u> such as buy in, adoption and sustainability.
Intervention support and assistance	Experienced users of an intervention in other school contexts can help to establish transferability of an intervention (context), developing working relationships can help to illustrate facilitators and barriers and provide advice and support as necessary (mechanisms), this increases penetration and sustainability (outcomes).	Hudson 2020, Leeman, 2018, Goldenthal et al., 2021, Humphrey et al., 2018, Fisher et al., 2020	
Incentives	Those leading professional development can consider what will be motivating for trainees, drawing upon their knowledge of the school and intervention (context), the right kind of incentives will help to engage recipients in the training (mechanism), this will improve buy-in to the intervention (outcome).	Fenton 2002 Guhn 2009 Cook 2015 Blaine 2017 Dariosis 2017 Hung 2014 Kennedy 2020	
School and community	A staff member leads on meaningfully consulting with student and family voice over time (context), this involves key stakeholders and demonstrates that feedback is valued and can shape implementation decisions (mechanism), this helps acceptability and adoption, as well as promoting an implementation climate (outcomes)	Williams 2021, Chambers 2020, Frigge 2019, Samdel 2010, Derrington 2013, Burriss 2009, Schildkamp 2019	

Appendix 16 – Included studies WP4

Paper type: A = WP1 TMF empirical papers; B = WP3 reviews; C = WP3 empirical studies; D = EEF evaluation reports; E = Bespoke search for PT elements; F = implementation strategy paper citations; G = Additional finds

First Author / date / type	Country	Intervention	Design	Sample Size	Implementation focus
Abu-Alghayth 2020 C	US	Lesson study	Qualitative	1	Leadership, culture, professional development, planning
Albers 2017 B	International	All	Review	36	Implementation strategies
Albers 2021 G	International	All	Review	109	Implementation strategies
Allen 2021 C	US	National Head Start/Public School Transition Demonstration Project	Qualitative	31	Community
Alonge 2020 A	Various in Eastern Mediterranean	WHO School Mental Health Programme	Mixed	202	Structures, agents of change (policy, teams, coordination)
An 2022 A	International	Diabetes management	Review	46	Training, communication, parent engagement, resource allocation, school environment
Anderson-Butcher 2016 C	US	Community Collaboration model	Mixed	10 schools	External support, collaboration, data
Andreou 2015 C	US	School-Wide Positive Behavioural Interventions and Supports	Qualitative	17	Agents for change, reflection
Anselma 2020 C	Netherlands	Kids in Action	Qualitative, process evaluation	51	Leadership, collaboration, agency
Aragon 2021 C	US	Expanded Food and Nutrition Education Program	Mixed	11	Training and support

Arnold 2021 C	US	RAP (Relax, be Aware, do a Personal rating) Club, a trauma-informed universal mental health intervention	Qualitative	13 schools	Structures, support
Asada 2020 C	US	School wellness policy	Qualitative	39	Adaptive leadership
Askell-Williams 2013 C	Australia	Kids Matter, mental health initiative	Quantitative	5000	Monitoring
Atkins 2008 G	US	Commonly recommended classroom practices for children with attention-deficit/hyperactivity disorder	Quantitative	115	Opinion leaders, agents for change
Atkins 2017 G	UK	All	Delphi study	NA	Implementation climate, structures, agents
Azad 2021 F	US	Partners in School (autism spectrum disorder services)	Quantitative	75	Fidelity, support, agents for change
Azukas 2019 C	US	Blended learning community of practice	Mixed	18	Professional development, community, reflection
Baffsky (2023) B	International	Those that reported the effects of implementation strategies for school-based universal mental health programmes	Review	21	Implementation strategies
Balfanz 2006 C	US	Mathematics Programme	Mixed-methods	6 schools	Professional development
Beidas 2010 B	International	All	Review	32	Professional development, systems
Beidas 2012 C	US	Cognitive behaviour therapy for child anxiety	Quantitative	17 schools	Training, agents of change
Beidas, 2015 C	US	Cognitive-behavioural, family, and psychodynamic therapy techniques	Quantitative	The final sample included 19 agencies with 23 sites, 130 therapists, 36 supervisors, and 22	Agents for change

				executive administrators.	
Bingham, 2018 A	US	Technology-mediated personalized learning	Qualitative	28 schools	Agents for change, structures
Bishop 2015 C	US	Embedded instructional learning trials	Quantitative	3	Reflection, agents for change
Blaine 2017 C	US	Childhood Obesity Prevention Intervention	Mixed	2 school districts	Readiness, training, incentives, champions,
Bodilly 1996 C	US	School reform	Mixed-methods	36 schools	Readiness, implementation strategies, external support, culture, engagement
Bogiatzis-Gibbons 2021 D	UK	National School Breakfast Programme	Mixed-methods	10 schools	Scale up, external support, sustainability, cost
Bonnell, 2015 C	UK	INCLUSIVE (initiating change locally in bullying and aggression through the school environment)	Mixed, process evaluation	1114	Feasibility, voice, training
Bosworth, 1999 A	US	Health Education Innovations	Quantitative	100	Planning, management, monitoring
Botvin 2018 C	US	LifeSkills Training, an evidence-based drug abuse prevention program	Quantitative	34 schools	Enabling structures, training
Brann 2021 F	US	Universal mental health screening	Mixed	2 schools	Resources, climate, enabling structures, agents for change
Bridich, 2021 C	US	All	Qualitative	3	Leadership
Brock 2017 B	International	Educator Training to Improve Implementation of Interventions for Students With Disabilities	Review	12	Fidelity
Brown 2014 E	US	Common Core State Standards	Qualitative	11	Capacity, enabling structures, agents for change

Burriss 2009 C	US	Wellness program	Qualitative	189	Communication, stakeholders
Calvert 2020 B	US	Physical activity	Review	37 programmes	Climate, PD, communication, resources, leadership, motivation, monitoring, readiness, outer context
Cane, 2015 A	UK	Targeting mental health in schools	Qualitative	4	Structures, agents for change
Casey 2014 C	Australia	School-community linked physical activity programme	Mixed, process evaluation	175	Fidelity, readiness, support
Cassar 2009 B	International	School-based physical activity and sedentary behaviour interventions	Review	27	Implementation models
Chalkley, 2018 C	UK	Marathon Kids running programme	Qualitative	20 schools	Structures, planning
Chambers, 2020 A	UK (Scotland)	Universal Free School Meals	Qualitative	19	Monitoring
Chang, 2008 C	China	Technology leadership	Quantitative	1880	Leadership
Charlton 2020 C	US	A Multi-Tiered System of Supports (MTSS) (a framework for organizing and integrating academic, social, and emotional supports).	Qualitative	27 states	Enabling structures
Cheung Kong 2019 C	Hong Kong	E-learning	Qualitative	35	Leadership, agents for change
Chong 2021 F	Singapore	Universal school prevention programmes	Qualitative	308	Enabling structures (organisational level capacity builders), training and technical support
Collier-Meek 2017 C	US	Good Behaviour Game and Caught Being Good Game	Quantitative	4	Performance feedback

Comiskey 2015 C	Ireland	Health Promoting Schools	Mixed, Process evaluation	7 schools	Scale up, support roles, needs assessment
Connors 2022 F	US	Measurement-based care	Quantitative	52	Importance and feasibility of implementation strategies
Cook 2015 F	US	Supportive beliefs intervention	Quantitative	62 schools	Implementation strategies, professional development, coaching, buy-in
Cook, 2019 A	US	All	Qualitative	5	Structures, agents, organisation, data, decision making
Corboy, 2007 A	Australia	CAST: CAMHS (Child and Adolescent Mental Health Service) and Schools Together	Qualitative	69	Resources, support
Coyle 2008 C	US	Olweus Bullying Prevention Program	Qualitative	9	Culture
Crane 2021 C	US	Computer assisted cognitive behavioural therapy for child anxiety	Qualitative	45	Fit and feasibility
Dack, 2016 G	US	Experiential instructional techniques	Qualitative	16 school districts	Fidelity
Dariotis 2017 C	US	Mindfulness and yoga	Qualitative	22	Intervention resources, buy-in, incentives
Davies 2017 D	UK	IRIS connect video technology system	Quantitative, Process evaluation	11 schools	Culture, reflection, agents of change
Davis 1998 E	US	Playground design	Qualitative	1 school	Student, staff and parent involvement, buy-in, planning
Day 2019 C	UK	Healthy lifestyle interventions (PhunkyFoods and The Food Dudes)	Qualitative	65	Fit and feasibility, resources, leadership

Denford 2017 B	International	School-based interventions to improve sexual-health,	Review	37	External support, PD, agents of change, fit
Derrington 2013 C	US	Teacher evaluation	Qualitative	14	Accountability, leadership
Desimone, 2002 B	US	Comprehensive school reform	Review	NA	Leadership, structures
Dimova 2021 E	UK	Maximising the Impact of Teaching Assistants (MITA)	Quantitative, process evaluation	128 schools	Leadership, buy-in, agents for change
Distel, 2019 C	US	School-based Trauma Intervention	Qualitative	10 participants	Resources, community, implementation climate, intervention fit, structures, teams
Dowling, 2020 G	Ireland	Social and emotional learning programme	Quantitative	675	Dosage, Adherence, Quality of Delivery, and Participant Responsiveness
Doyle 1999 C	US	STEM curriculum	Mixed-methods	81 schools	Professional development
Duhon 2008 C	US	Academic performance interventions	Quantitative	7	Reflection
Durand, 2016 C	US	Common Core State Standards (CCSS)	Mixed-methods	9 schools	Leadership, structures
Durlak 2008 B	International	Health interventions	Review	81	Structures, outer context, training, support
Dusenbury, 2003 B	International	Drug abuse prevention	Review	NA	Fidelity
Dyssegaard, 2017 B	International	Research based knowledge	Review	34	management and leadership, professional development, support systems, fidelity, attitudes and perceptions, and sustainability
Eisman 2022 F	US	Universal prevention interventions	Mixed	171 (survey), 23 (interviews)	Fidelity, adaptability

Elsenburg, 2022 C	Netherlands	Approach targeting education, health, and poverty	Qualitative	4 schools	Implementation climate, leadership, training, values, networks, agents, structures
Ernst, 2009 C	US	Environment-Based Education	Quantitative	287	Values, attitudes, voices, buy-in, resources, training, structures, capacities
Evans, 2015 A	UK	Social and emotional learning intervention	Process evaluation	15	Training, agents of change
Fagan 2009 C	US	School-Based Prevention Programming	Qualitative	12 community coalitions	Agents for change
Fallon 2015 F	International	Performance feedback as a strategy to promote the implementation of school-based practices	Review	47	Implementation strategies
Fallon 2018 C	US	A class wide group contingency programme	Quantitative	1 school	Communication
Fenton 2002 A	US	School reform	Mixed-methods	15 schools	Professional development, readiness
Firth 2008 C	Australia	Beyond blue schools' research initiative	Qualitative, process evaluation	25 schools	Support, resources, fit
Fisher 2020 C	UK	Wellbeing in Secondary Education (WISE)	Mixed	12 schools	Support, leadership, training
Fishman 2018 C	US	Evidence-based practices for autism	Quantitative	67	Agents for change, intentions
Fixsen, 2005 B	International	All	Review	22	Structures, voices
Flaspohler 2012 C	US	Whole school prevention initiatives	Mixed	12 schools	Technical assistance, support
Foliano 2019 D	UK	Changing Mindsets	Quantitative, process evaluation	101 schools	Structures, professional development
Freeman 2003 C	US	Use of Continuous Systems-Level Assessment Strategies	Qualitative	1 school	Readiness, structures, systems, leadership,

					communication, planning, resources, values
Freeman 2014 C	Australia	Whole school approaches for resolving conflict	Qualitative	10 primary schools	Vision, commitment, processes, leadership, monitoring and feedback
Frigge 2019 A	US	Expanded School Breakfast Program	Qualitative	23	Values, support, monitoring, fit and feasibility
Gabby 2017 A	Israel	Technology Enhanced Learning Environment	Mixed-methods	14	Agents of change, motivation
Gagnier, 2020 A	US	Spatial thinking skills	Mixed-methods	NA	Fit, monitoring
Gagnon 2020 C	US	Positive behavioural interventions and supports	Quantitative	406 schools	Leadership, monitoring
Gale, 2020 A	US	STEM curriculum	Qualitative	10	Monitoring, fidelity
Garvis, 2013 A	Australia	The Victorian Early Years Learning and Development Framework	Mixed-methods	405	Leadership, agents of change
Gee 2020 B	International	Psychological interventions for mental health	Review	50	Fit, support, training
Giraldo-García, 2021 C	US	Student Voice Programme	Qualitative	22 schools	Voices, engagement, participation, reflection, communication, structures, agents
Goldenthal, 2021 A	US	Comprehensive implementation training and support	Quantitative	33	Fidelity, structures, leadership
Goldring, 2015 C	US	Instructional Leadership	Mixed-methods	4 case study districts	Time, training, structures, support, data, reflection
Goldstein, 2015 A	US	Phonological Awareness	Mixed method, process evaluation	Various	Structures

Goodman-Scott, 2018 C	US	Positive Behavioural Interventions and Supports (PBIS)	Qualitative	6 participants	Leadership, organisation, structures, resources, voices, engagement
Gorard 2017 D	UK	Children's University	Quantitative, process evaluation	68 schools	Adaptability, agents of change
Gorard, 2016 D	UK	Youth Social Action Trials	Quantitative, process evaluation	71 schools	Participation, voices, reflection, capacities, resources, attitudes
Gouédard, 2020 C	International	Curriculum Reform	Review	NA	Structures, systems, vision, community, voices, values, agents, data
Greaves 2017 D	UK	Achieve Together	Quantitative, process evaluation	14 schools	Leadership
Greenhalgh, 2019 G	International	All	Review	13	Spread, scale up
Gregory 2021 F	US	Restorative Practices (RP) to improve school climate and address disparities in discipline	Qualitative	18	Enabling structures, infrastructure, capacity, support
Gregory, 2007 C	US	Violence prevention	Quantitative	12 schools	Implementation climate, intervention fit, structures, data, reflection
Griggs, 2016 D	UK	Ashford Teaching Alliance Research Champion Project	Quantitative, process evaluation	5 schools	Collaboration, structures
Grissom 2021 G	International	All	Review	219	Accountability, leadership
Grossi, 2019 C	US	School to work collaborative model	Mixed-methods	11 schools	Vision, support, collaboration, community
Gu 2021 D	UK	Research Schools	Quantitative, process evaluation	10	Structures
Guhn, 2009 B	US	School Development Program and Child Development Project	Review	26	Structures, agents of change, voice

Gunderson 2021 E	US	Evidence informed practices to reduce suicide	Qualitative	36 interviews, 16 focus groups	Adaptability
Hadjithoma, 2009 C	Cyprus	ICT in primary schools within emerging communities of implementation	Qualitative	4 schools	Community, structures, resources, training, capacities, agents
Hall, 1997 C	US	Performance Pay Plan	Mixed	700	Community, incentives
Hanckel, 2019 C	UK	The Daily Mile	Mixed	22 participants	Readiness, adoption, feasibility
Hardman 2017 D	UK	Models for developing Early Career Teachers (ECTs), mentors, and induction leads	Mixed	98 schools	Promise, feasibility and scalability
Harland 2021 D	UK	Connecting Maths Concepts programme	Quantitative, process evaluation	189	Training and support, acceptability, feasibility
Harris 2019 B	International	Self-management interventions for asthma	Review	55	Intervention fit, agents of change, capacities, acceptability
Hepburn 2019 B	International	Classroom Management	Review	27	Structures, fidelity, training, support, resources,, time, communication
Herlitz, 2020 B	International	Health interventions	Review	24 studies	Sustainability
Herman 2017 C	US	Nature of Science Instruction	Qualitative	13 participants	Attitudes, values, voices, agents, structures, reflection, data
Higgins 2012 G	US	General	Mixed	25 teams	Teams, role and responsibilities
Hodgen 2019 D	UK	Catch Up Numeracy	Quantitative, process evaluation	150 schools	Agents of change
Hollingshead, 2009 A	US	Character Education Programme – Rachel's Challenge	Mixed-methods	8 schools	Agents of change, voice, values

Holmes 2022 C	US	Incredible Years Teacher Classroom Management (IY TCM) program	Quantitative	44	Agents for change, training
Holt 2022 G	UK	Mindfulness approaches in early years	Qualitative	5	Reflection, agents for change
Hopfenbeck, 2015 C	Norway	Assessment for Learning	Qualitative	58	Structures, climate
Hu, 2020 C	Netherlands	Observation-Based Coaching Programme	Qualitative	18 participants	Implementation climate, structures, voices, training, communication
Hudson, 2020 A	UK	Mindfulness – whole school approach	Qualitative	15	Leadership
Humphrey 2020 D	UK	Achievement for All	Quantitative, process evaluation	134 schools	Structures, adaptability, champions, parent engagement
Humphrey, 2018 D	UK	Good Behaviour Game	Quantitative, process evaluation	77 schools	Fit and feasibility
Hung, 2014 B	Global	Health-Promoting Schools	Qualitative Review	6 articles	Commitment, accountability, structures, systems, agents
Husain 2019 D	UK	Fit to Study physical activity intervention	Quantitative, process evaluation	104 schools	Agents for change, intervention fit
Icel, 2018 C	US	Science, Technology, Engineering, Maths policy	Qualitative	3 schools	Motivation, leadership, planning, teams, professional development
Ikemoto 2016 E	US	Geometry curriculum	Mixed-methods	8 schools	Buy in, internal support, resources
Ismail 2021 B	International	Fruit and vegetables distribution	Review	24	Fit, structures, voice, agents for change, resources, time
Jarke 2020 C	UK	Technology-based Intervention for Reading	Mixed-methods	20 schools	Resources, training, capacities, structures

Jeffers, 2010 C	Ireland	Transition Year Programme	Mixed-methods	6 schools	Leadership, structures, policies, systems, values
Johnson 2018 C	US	PAX Good Behaviour Game	Quantitative	138	Coaching, fidelity, dosage
Judkins, 2019 C	US	School-wide Positive Behaviour Interventions and Supports	Quantitative	19	Leadership, agents for change
Kaimal, 2016 C	US	Incentive-based Programs	Mixed-methods	12 schools	Misconceptions, overcoming challenges, professional development, sustainment, capacities, leadership
Kannapel 2000 E	US	The Kentucky Education Reform Act (KERA)	Qualitative	6 schools	Leadership, accountability, professional development
Katz 2022 E	US	School nutrition programmes	Qualitative	23	External support, implementation climate, implementation strategies
Kilgallon 2008 E	US	School reform	Qualitative	57	Internal support, professional development, collaboration, wellbeing
Killerby, 2018 B	International	All	Review	13	Monitoring
Kisa, 2015 C	US	America's Choice	Quantitative	1722	Professional development
Knight 2021 D	UK	Research Schools in Opportunity Areas	Mixed	10 schools	Leadership, structures
Kodish, 2020 C	US	School-Based Responses to Student Suicide Risk	Qualitative	34 (mixed staff, students, parents)	Structures, procedural clarity, values, voices, support
Koh, 2021 B	International	School improvement initiatives	Review	16	Sustainability
Kratz, 2019 G	US	Strategies for Teaching based on Autism Research (STAR)	Quantitative	158	Climate

Kretlow 2010 B	International	Coaching teachers	Review	13	Motivation, communication, modelling
Lander 2020 C	Australia	Motor competence intervention	Mixed	18	Fit, feasibility, adaptability
Lane 2022 F	Australia	Physically Active Children in Education (PACE)	Mixed	344	Enabling structures, agents for change, intervention fit
Langford, 2015 B	International	Health-promoting Schools Framework	Review	26 studies	Tailoring, alignment, values, planning, training and support, participation, ownership, resources
Larson 2018 C	US	Teacher wellbeing promotion	Quantitative	4	Wellbeing
Larson 2021 D	US	Beliefs and Attitudes for Successful Implementation in Schools for Teachers (BASIS-T)	Quantitative	9 schools	Motivation, agents of change
Leadbeater 2015 C	Canada	Walk away, Ignore, Talk it out and Seek help (preventing peer victimisation)	Qualitative	24	Leadership, champions, sustainability, agents for change
Leeman, 2018 A	US	Physical activity, nutrition, health education and parent engagement	Mixed-methods, process evaluation	69	Structures, reflection, voices
Leis, 2017 C	US	Leading Together	Mixed-methods	8 schools	Agents of change, relationships, trust, leadership
Leung, 2020 A	US	School-based referral system for sexual health services	Qualitative	10 participants	Values, voices, reflection, teams, community, structures, policies, networks, communication
Levin, 2013 C	US	Literacy Design Collaborative (LDC) and the Mathematics Design Collaborative (MDC),	Mixed-methods	Survey 3,171 Interviews 40 (approximately)	Data, monitoring, reflection, structures, voices

				Observations 4	
Livet 2018 C	US	Digital implementation support system for school mental health	Mixed	758	Training, support, monitoring
Locke 2019 F	US	Various evidence-based universal supports targeting student social, emotional, and behavioural outcomes	Qualitative	37	organizational implementation context (implementation leadership, climate, and citizenship behaviour), enabling structures, agents for change
Lohrmann 2008 G	US	School wide positive behaviour support	Qualitative	14	Agents for change, buy-in, motivation, commitment
Loman 2010 E	US	First Step to Success (FSS), a targeted intervention for young students at risk for behaviour disorders	Quantitative	29 schools	Enabling structures, agents for change, sustainability
Lopez-Yanez, 2012 C	Spain	All	Qualitative	10	Leadership, climate, structures
Lord 2017 D	UK	Evidence for the Frontline	Quantitative, process evaluation	32 schools	Readiness, feasibility
Lord, 2017 C	UK	Literacy Octopus	Quantitative, process evaluation	823 schools	Motivation, champions, fit,
Lyon 2011 E	International	Training of mental health practitioners	Review	Not clear	Fit, support, PD, monitoring, motivation, adoption
Lyon, 2019 A	US	Social, emotional, and mental health services	Quantitative	200	Feasibility
Malloy 2015 E	US	Social-Emotional and Character Development Program	Quantitative	46	Climate
March 2020 C	US	Response to Intervention	Qualitative	10	Structures

Marchant, 2019 C	UK	Curriculum-based outdoor learning for children aged 9-11	Qualitative	13 teachers, 10 children	Accountability, data, opportunity, structures, agents, voices
Martinez 2019 E	US	Positive Behavioural Interventions and Supports	Qualitative	Can't tell	Buy-in, voice
Martinez, 2016 C	US	Social Emotional Learning (SEL)	Qualitative	20 teachers and educational specialists	Reflection, voices, values, participation, community, commitment, buy-in, readiness
Massey Combs, 2020 C	US	Botvin LifeSkills Training	Quantitative	989	Professional development, fidelity
Maxwell et al., 2019 D	UK	Literacy intervention	Quantitative, process evaluation	389 schools	Community, support
Maxwell, 2019 D	UK	Lincolnshire teaching assistants scale-up campaign	Quantitative, process evaluation	283	Agents of change
McBride 2002 C	Australia	School Health and Alcohol Harm Reduction Project	Mixed-methods	29	Fidelity, professional development,
McCormick, 2019 C	US	Content-enriched alignment	Mixed-methods	21 schools	Structures, intervention fit, intervention climate
McDaniel, 2017 C	US	Schoolwide positive behavioural interventions and support	Qualitative	10	Systems, reflection
McIsaac 2015 E	Canada	Health promoting schools	Qualitative	9 schools	Vision, distributed leadership, collaborative culture
McLoughlin 2020 C	US	School Wellness Integration Targeting Child Health (SWITCH)	Mixed	30	Adaptability, monitoring
McLoughlin 2022 F	US	SWITCH (school wellness intervention)	Mixed	52 schools	Sustainability, culture, support, leadership

McNally 2016 D	UK	ABRA: Online Reading Support	Quantitative, process evaluation	51 schools	Intervention resources
Medina 2019 C	US	Full-service Community School Implementation (FSCSs)	Qualitative	8 schools	Structures, capacity, community, voices, leadership
Melgarejo 2020 C	US	Evidence-based practices (EBPs) for autism spectrum disorder (ASD)	Quantitative	66 schools	Leadership
Mendenhall, 2010 C	US	Expanded School Improvement Model (ESMH)	Qualitative	40 participants	Professional development, leadership, consultation, resources, systems, and structures
Menzies 2016 C	UK	Hallé SHINE on Manchester	Mixed-methods, process evaluation	56 schools	Voice
Merle 2022 F	International	Social Emotional and Behavioural	Review	28	implementation strategies
Michael 2019 B	International	Physical Activity	Review	28	Structures, resources, agents for change, buy-in, fit, training, support
Miedijensky 2019 E	Israel	Education for Sustainability	Qualitative	3 schools	Planning, commitment
Miles 2022 F	US	Reading Rescue	Quantitative	250	Support, agents for change
Miller 2015 D	UK	Physically active lessons	Mixed	6 schools	Support, fidelity
Mohammed 2008 C	Pakistan	Learner centred approach	Qualitative	5	Adaptability
Monzalve 2021 E	US	Behaviour: Contextual Fit Enhancement Protocol	Quantitative	4	Fidelity, intervention fit, buy-in, professional development
Moore 2021 C	US	Trauma informed prevention programme	Quantitative	29 schools	Fidelity, acceptability, feasibility, adoption
Morrison 2019 C	US	Sanford Harmony social and emotional learning (SEL) program	Mixed	5 schools	Professional development, support, collective decision making, planning

Morse 2015 E	US	Student-centered approaches,	Review	Not clear	Voice, agents for change
Mouw, 2016 C	US	Theater-based HIV Prevention Intervention AMP!	Qualitative	16 participants	Values, voices, participation, communication, structures and systems
Murphy 2017 D	UK	Boarding schools for children in need	Qualitative	20	Acceptability
Nachmias 2004 C	Israel	Pedagogical Innovations using Technology	Mixed-methods	10 schools	Implementation climate, structures, systems, resources, organisation, policies
Nathan 2017 B	International	Physical Activity	Review	17	Structures, resources, capacity, capability, priority, support
Naylor 2015 B	International	Physical Activity	Review	18	Time, resources, climate
Nelson 2014 B	International	Teacher engagement with evidence	Review	252	Structures, outer context, PD,
Nelson 2019 D	UK	Northeast Primary Literacy Scale-up	Quantitative, process evaluation	Surveys 400, 19 case study schools	Structures
Nielsen, 2019 C	Denmark	Svendborgproject (physical activity)	Qualitative	12	Values, priorities, professional development, simplicity, dedication
Noell 2014 F	International	Treatment plan implementations in schools	Review	29	Implementation strategies
Nunes 2018 D	UK	1stClass@Number	Quantitative, process evaluation	491	Intervention resources, professional development
O'Hare 2018 D	UK	Positive Action	Mixed-methods	15 schools	Adaptation, dosage, fidelity
Oliver 2015 G	US	Good Behaviour Game	Mixed-methods	1 school	Reflection

Ott, 2020 C	US	Pregnancy prevention in rural communities	Mixed-methods	2 schools	Training, leadership, structures, networks, voices, values, reflection
Pampaka 2021 D	UK	Increasing Competence and Confidence in Algebra and Multiplicative Structures (ICCAMS)	Quantitative, process evaluation	109 schools	Professional development
Pas 2015 C	US	Good Behaviour Game	Quantitative	210	Coaching
Pas 2022 F	US	A teacher coaching model	Quantitative	151	Fidelity
Pearce 2022 F	Australia	Friendly School (antibullying)	Qualitative	8 schools	Leadership, organisational structures, buy-in and commitment
Pearlman 2005 C	US	School Health Index	Mixed	102 schools	Agents for change
Pearson, 2015 B	UK	Health-promotion programmes	Review (Realist)	41 studies	Voices, values, agents, structures, community, implementation climate, intervention fit
Penlington 2008 G	UK	Improving schools	Qualitative	20 schools	Leadership, shared values, scale up
Phillips 2017 C	US	Vocabulary and language curriculum	Quantitative	39 classrooms	Readiness, fidelity, external support, intervention resources
Phillips 2020 C	US	AI tutoring system	Quantitative	9 schools	Fidelity, time, coaching, intervention resources
Prince, 2018 C	US	Instructional Practices for English Language Learners	Qualitative	5 teachers	Resources, intervention fit, readiness, structures
Probart 1997 C	US	Mid-LINC, an interdisciplinary nutrition curriculum	Mixed	469	Structures, agents of change
Proctor, 2010 B	International	All	Review	NA	Conceptualisation of Implementation outcomes

Quintanilha, 2013 C	Canada	Alberta Nutrition Guidelines for Children and Youth (ANGCY)	Qualitative	18	Champions, community
Reinke 2008 G	US	Teacher consultation for behaviour	Quantitative	4	Agents for change
Reis 2010 C	US	Reading enrichment	Qualitative	11 schools	Modelling, collaboration, fidelity
Reumann-Moore, 2011 C	US	Literacy Design Collaborative (LDC)	Mixed-methods	306 (approximately)	Values, voices, agents, structures, reflection
Rienzo 2015 D	UK	Changing Mindsets	Quantitative	6 schools	Training
Robinson, 2008 C	US	Inquiry Team Process	Mixed-methods	1,450 schools	Voices, networks, teams, support, training, structures
Robinson, 2019 D	International	All	Review	NA	Leadership
Roney 2020 B	US	Restorative approach to behaviour	Review	20	Intervention clarity, culture, professional development, internal support, readiness
Ronto, 2020 B	International	School-based healthy food and beverage policies	Review	28 studies (mixed method)	Resources, planning, voices, community, participation, reflection, structures
Rose 2017 D	UK	Research Learning Communities	Quantitative, process evaluation	119 schools	Agents of change, reflection
Roy 2018 D	UK	Best Practice in Setting	Quantitative, process evaluation	127 schools	Buy-in, fidelity
Ruble, 2013 C	US	Individual Education Plans for children with Autism	Quantitative	47 teachers and children	Communication, planning, voices, agents, reflection, feedback

Runge 2019 D	UK	Embedding contextualisation in English and mathematics GCSE teaching	Qualitative	6 schools	Planning, reflection
Ryan Jackson, 2018 A	US	All	Review	NA	Climate, agents for change, leadership, reflection
Sadjadi 2021 B	International	Health-promoting school approaches targeting bullying and violence	Review	17 studies (mixed method)	Structures, policies, networks, buy-in, readiness, planning, agents
Salvaterra, 1998 C	US	Block scheduling	Qualitative	12 schools	Values, vision, planning, voices, teams
Samdel, 2010 B	International	Health-promoting schools	Review	NA	Leadership, implementation climate, structures, agents
Savage, 2016 C	New Zealand	School Wide Positive Behaviour Support	Qualitative	11 participants	Readiness, student empowerment, community, professional learning, evidence -based decision making
Scaletta 2021 C	US	Positive Behavioural Intervention and Supports	Qualitative	24	Leadership, agents for change
Schelvis, 2016 C	Netherlands	Occupational Health Intervention	Mixed-methods	NA	Voices, agents, structures, organisation, participation, engagement
Schildkamp 2019 C	Denmark	Data team	Qualitative	14 schools	Reflection, leadership, teams
Shepherd 2014 B	International	Programmes to prevent sexually transmitted infections	Review	12	Training, agents, buy-in, voice, fit, planning
Shoesmith, 2021 B	International	Health behaviour interventions	Review	31 mixed method articles	Sustainability, maintaining, structures, readiness, planning
Sibieta 2019 D	UK	Advocacy Provision	Quantitative	480 schools	Structures, support

Sichel 2022 F	US	Measurement feedback system for behavioural health services	Mixed	80	Data, feasibility, incentives
Sider 2019 C	Egypt	Peer coaching	Qualitative	8	Professional development
Silva, 2021 B	International	Student-centred models	Review	29 articles	Values, voices, participation, agents
Silviera-Zaldivar, 2019 C	US	Social skills interventions	Mixed-methods	33	Training, time, support, prioritization, materials, and staff mind-set
Simmons, 2016 C	US	One to one Computing Initiative	Qualitative	6	Professional development, communication, resources, planning, sustainability, self-efficacy
Sims 2021 B	International	PD	Review	104	Fidelity, intervention fit, planning, structures
Skage, 2022 C	Norway	Physically active lessons	Qualitative	7	Collaboration, reflection, leadership, structures
Smith 2013 E	Norway	Assessment for learning culture	Qualitative	2	Leadership, voice
Smith 2015 B	International	Walking School Buses	Review	12	Time, agents
Solomon 2012 F	International	Performance feedback in school settings to increase teachers' use of classroom-based interventions	Review	36	Performance feedback as an implementation strategy
Speckesser, 2018 D	UK	Embedding Formative Assessment	Quantitative, process evaluation	140 schools	Professional development
Speight, 2016 D	UK	Research into Practice – Evidence-informed Continuing Professional Development in Rochdale	Quantitative, process evaluation	10 schools	Buy in, structures

Sporte, 2013 C	US	Teacher Evaluation in Practice (REACH)	Mixed	Surveys 2,000 Interviews 31	Structures, Intervention fit, agents, capacity, capability
Stone 2020 D	UK	Helping Handwriting Shine	Qualitative	103 schools	Acceptability, monitoring
Stormont 2015 F	International	Coaching teachers on the use of social behaviour interventions	Review	29	Coaching implementation strategies
Straw 2020 D	UK	Mentoring for Early Career Chemistry Teachers	Mixed-methods	23	Needs assessment
Suhrheinrich, 2020 C	US	Classroom pivotal response teaching	Quantitative	98	teacher factors, organizational factors, fidelity, sustainment, satisfaction
Sun, 2007 A	International	All	Review	31	Structures
Sutherland 2019 D	UK	Digital Feedback in Primary Maths	Quantitative, process evaluation	34 schools	Training
Szeszulski 2020 F	US	Physical activity approaches	Qualitative	15	Adoption, buy-in, support
Szeszulski 2022 F	US	Physical activity programmes	Quantitative	139	Agents for change, roles and responsibilities
Tancred, 2018 B	International	Substance use and violence prevention	Review	16 reports	Values, structures, community, voices, reflection, preparing and exploring
Taylor, 2019 D	UK	Assess for Success	Mixed-methods	6 FE Colleges	Intervention resources, adaptation
Telzrow, 2000 C	US	Intervention based assessment	Quantitative	227 schools	Problem-solving, fidelity
Togerson 2016 D	UK	Affordable Maths Tuition	Quantitative, process evaluation	64 schools	Adaptability
Tomokawa 2018 E	Thailand	National school health policy	Qualitative	19	Enabling structures, agents for change

Trapani, 2018 A	US	Understanding by Design instructional framework	Quantitative	53	Reflection
Tunks, 2009 A	US	Teacher Quality Grant innovation program	Mixed-methods	10	Reflection, values, voices
Tyre, 2017 C	US	Schoolwide positive behaviour interventions and supports (SWPBIS)	Qualitative	36 schools	Implementation climate, reflections, voices, values
Valois 2015 C	US, Canada	Healthy School Communities Project	Qualitative	11 schools	Sustainability, culture
Van Geel, 2017 A	UK	Data based decision making	Quantitative	16 schools	Reflection, leadership, structures
van Kuijk, 2021 B	International	Success for All	Review	16	Leadership, fulfilling organizational conditions, staff development
Veel 2009 E	Australia	Sustainable pedagogy	Qualitative	2	Leadership, buy-in, data
Von der Embse 2019 G	US	Integrated school mental health services	Quantitative	1 school	Data
Walker 2022 F	US	Classroom based physical activity approaches	Qualitative	15	Champions, training, planning, positive reinforcement, agents for change
Waller 2017 B	International	Tobacco and substance use interventions	Review	15	Climate, training, buy-in, agents, resources, support, budgets, capacity
Walsh-Bailey 2021 F	US	Blues Program, an evidence-based cognitive behavioural group depression indicated prevention program	Mixed	11	Adaptations, reflection
Warren 2019 C	UK	INCLUSIVE trial (whole-school health promotion)	Mixed-methods	40 secondary schools	Structures, intervention fit, voices, reflection

Weatherson 2017 B	International	Physical activity	Review	15	Structures, intervention fit, PD, capability, resources, prioritisation, leadership, motivation
Weiland 2018 B	US	Preschool Curricula and Professional Development	Review	5	Structures, resources, voices, monitoring, PD
West 2017 D	UK	Challenge the Gap	Quantitative, process evaluation	104 schools	Enabling structures, professional development, leadership, climate
Wilhelm, 2021 C	US	Project TRUST (Training for Resiliency in Urban Students and Teachers)	Qualitative (longitudinal)	21	Reflection, agents of change, structures, voices
Williams 2022 E	US	Autism interventions: pivotal response training (PRT), discrete trial training (DTT), and visual schedules (VS)	Quantitative	65 schools	Leadership, climate
Williams, 2021 C	US	Evidence-based practices for youth with autism	Qualitative	32	Climate
Wolfenden 2017 B	International	School-based policies or practices targeting risk factors for chronic disease	Review	27	Implementation strategies
Wolk 2019 C	US	School mental health team training	Mixed-methods	27	Teams, burnout, resources, leadership
Zhang 2023 F	US	Behavioural preventative practices	Quantitative	43	Agents for change

Appendix 17 – Quality Appraisal for included studies in WP4

AMSTAR-2 Appraisal of reviews

First author year	Albers 2021	Albers 2017	An 2021	Baffsky 2023	Beidas 2012	Brock 2017	Desimone 2002	Dusenbury 2003	Dyssegaard 2017	Fallon 2015	Fixsen 2005
1. Did the research questions and inclusion criteria for the review include the components of PICO?	No	No	No	Yes	No	Yes	No	Can't tell	No	No	No
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	Yes	Yes	Yes	No	No	No	Partial yes	Can't tell	Yes	No	Yes
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes	Yes	Yes	Yes	Yes	Yes	Partial yes	Can't tell	Yes	Yes	Yes
5. Did the review authors perform study selection in duplicate?	Yes	Yes	Can't tell	No	Can't tell	No	Can't tell	Can't tell	Can't tell	Can't tell	No
6. Did the review authors perform data extraction in duplicate?	Can't tell	Yes	Can't tell	No	Can't tell	Yes	Can't tell	Can't tell	Can't tell	Can't tell	No

7. Did the review authors provide a list of excluded studies and justify the exclusions?	No	No	Yes	No	No	No	No	No	No	No	No
8. Did the review authors describe the included studies in adequate detail?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	Can't tell	Partial yes	No	Yes	No	Yes	No	Can't tell	Yes	No	No
10. Did the review authors report on the sources of funding for the studies included in the review?	No	No	No	No	No	No	No	No	No	No	No
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	Yes	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	Yes	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis
13. Did the review authors account for RoB	No	No	No	Yes	No	Yes	No	No	Yes	No	No

in individual studies when interpreting/ discussing the results of the review?											
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	N/A	N/A	N/A	Yes	N/A	Yes	N/A	N/A	N/A	No	N/A
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Yes	No	Yes	Yes	No	Yes	No	No	No	No	Just funding

First author year	Gee 2020	Gouédard 2020	Greenhalgh 2018	Grissom 2021	Guhn 2009	Herlitz 2020	Killerby 2018	Koh 2021	Langford 2015	Lyon 2011
1. Did the research questions and inclusion criteria for the review include the components of PICO?	No	Can't tell	No	No	No	No	No	No	Yes	No
2. Did the report of the review contain an explicit statement that the review	Yes	No	Yes	Yes	Yes	Yes	Partial yes	Yes	Yes	No

methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?										
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes	Can't tell	Partial yes	Partial yes	Yes	Yes	Yes	Yes	Yes	No
5. Did the review authors perform study selection in duplicate?	Yes	Can't tell	Can't tell	Yes	Can't tell	Yes	Can't tell	Yes	No	Can't tell
6. Did the review authors perform data extraction in duplicate?	Yes	Can't tell	Can't tell	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Can't tell
7. Did the review authors provide a list of excluded studies and justify the exclusions?	No	No	No	No	No	No	No	No	No	No
8. Did the review authors describe the included studies in adequate detail?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	No	No	No	No	Yes	Yes	Yes	No	Can't tell	No
10. Did the review authors report on the sources of funding for the studies included in the review?	No	No	Yes	No	No	No	No	No	No	No
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis

12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis
13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?	No	No	No	No	Yes	Yes	Yes	No	No	No
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	No	No	No	Yes	No	Yes	Yes	No	Yes	No
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	N/A	N/A	N/A	Yes	N/A	N/A	Yes	No	No	N/A
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Yes	Just funding	Yes	No	No	Yes	No	Just conflict	Yes	No

First author year	Merle 2022	Morse 2015	Nelson 2014	Noell 2014	Pearson 2015		Proctor 2010	Robinson 2019	Ronto 2020	Sadjadi 2021	Solomon 2012	Samdel 2010
1. Did the research questions and inclusion criteria for the review include the components of PICO?	No	No	Yes	Yes	Yes		No	No	No	No	Yes	No
2. Did the report of the review contain an explicit statement that	No	No	Yes	Partial yes	Yes		Yes	No	Yes	Yes	No	Yes

the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?												
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes	Yes	Yes	Yes	Yes		Yes	No	No	No	Yes	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes	No	Yes	No	Yes		Yes	No	Yes	Yes	No	Yes
5. Did the review authors perform study selection in duplicate?	No	Can't tell	Can't tell	No	Yes		Can't tell	No	Yes	No	Can't tell	Yes
6. Did the review authors perform data extraction in duplicate?	No	Can't tell	Can't tell	No	No		Yes	No	No	Yes	Can't tell	Can't tell
7. Did the review authors provide a list of excluded studies and justify the exclusions?	No	No	No	No	No		No	No	No	No	No	No
8. Did the review authors describe the included studies in adequate detail?	Yes	Yes	No	Yes	Yes		No	No	Yes	Yes	Yes	Yes
9. Did the review authors use a	Yes	No	No	Can't tell	Yes		No	No	Yes	Yes	No	No

satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?												
10. Did the review authors report on the sources of funding for the studies included in the review?	No	No	No	No	No		No	No	No	No	No	No
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	Yes	No meta-analysis	No meta-analysis	Yes	No meta-analysis		No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	Yes	No meta-analysis
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	Yes	No meta-analysis	No meta-analysis	No	No meta-analysis		No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No	No meta-analysis
13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?	Yes	No	No	No	Yes		No	No	Yes	Yes	No	No
14. Did the review authors provide a	Yes	No	No	Yes	Yes		Yes	No	Yes	Yes	Yes	Yes

satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?												
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	N/A	N/A	N/A	No	N/A		N/A	N/A	Yes	N/A	No	N/A
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	No	No	No	No	Yes		Just funding	No	Yes	Yes	No	No

First author year	Shoesmith 2021	Silva 2021	Stormont 2015	Sun 2007	Tancred 2018	van Kuijk 2021	Weiland 2018	Wolfenden 2017
1. Did the research questions and inclusion criteria for the review include the components of PICO?	No	No	Yes	Yes	No	No	Yes	Yes
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

3. Did the review authors explain their selection of the study designs for inclusion in the review?	No	Yes	Yes	Yes	No	No	Yes	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes	Yes	No	No	Yes	Yes	No	Yes
5. Did the review authors perform study selection in duplicate?	Yes	Can't tell	Yes	Yes	Yes	Can't tell	No	Yes
6. Did the review authors perform data extraction in duplicate?	Yes	Can't tell	Can't tell	Yes	Yes	Can't tell	No	Yes
7. Did the review authors provide a list of excluded studies and justify the exclusions?	No	No	No	No	No	No	No	Yes
8. Did the review authors describe the included studies in adequate detail?	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	Yes	Yes	No	Yes	Yes	No	No	Yes
10. Did the review authors report on the sources of funding for the studies included in the review?	No	No	No	No	No	No	No	Yes
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis	No meta-analysis
13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?	Yes	Yes	No	No	Yes	No	No	Yes
14. Did the review authors provide a satisfactory explanation for, and discussion of,	Yes	Yes	No	No	Yes	Yes	Yes	Yes

any heterogeneity observed in the results of the review?								
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	Yes	N/A	N/A	N/A	N/A	N/A	N/A	Yes
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Yes	Yes	Yes	No	Yes	Yes	No	Yes

Mixed-methods Appraisal Tool (MMAT) Randomised Controlled Trials only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	2.1. Is randomization appropriately performed?	2.2. Are the groups comparable at baseline?	2.3. Are there complete outcome data?	2.4. Are outcome assessors blinded to the intervention provided?	2.5 Did the participants adhere to the assigned intervention?
Aragon 2021	Yes	Yes	Yes	Can't tell	No	No	Yes
Atkins 2008	Yes	Yes	Yes	Yes	No	No	Yes
Botvin 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dimova 2021	Yes	Yes	Yes	Yes	No	No	Yes
Gorard 2016	Yes	Yes	Yes	Yes	No	Can't tell	No
Kratz 2019	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Larson 2021	Yes	Yes	Yes	Yes	No	Can't tell	Yes
Miles 2022	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Zhang 2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) non-randomised studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	3.1. Are the participants representative of the target population?	3.2. Are measurement s appropriate regarding both the outcome and intervention (or exposure)?	3.3. Are there complete outcome data?	3.4. Are the confounders accounted for in the design and analysis?	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?
Askill-Williams 2013	Yes	Yes	Yes	Yes	No	No	No
Beidas 2015	Yes	Yes	Yes	Yes	No	Yes	No
Bishop 2015	Yes	Yes	No	Yes	Yes	Yes	Yes
Dowling 2020	Yes	Yes	Yes	Yes	No	Yes	Yes
Duhon 2008	Yes	Yes	No	Yes	Yes	No	Yes
Goldenthal 2021	Yes	Yes	Yes	Yes	No	No	No
Gregory 2007	Yes	Yes	Can't tell	Yes	No	Yes	No
Grossi 2019	Yes	Yes	Yes	No	Can't tell	Yes	Can't tell
Judkins 2019	Yes	Yes	No	Yes	Can't tell	No	Can't tell
Kisa 2015	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell
Leis 2017	Yes	Yes	Can't tell	Yes	No	Yes	Can't tell
Loman 2010	Yes	Yes	No	Yes	No	No	Yes
Lord 2017	Yes	Yes	Yes	Yes	No	No	Yes
Maxwell 2019	Yes	Yes	No	Yes	No	Yes	Can't tell

McLoughlin 2020	Yes	Yes	No	Yes	Can't tell	No	No
Miller 2015	Yes	Yes	No	Yes	Yes	Yes	Yes
Monzalve 2021	Yes	Yes	No	Yes	Yes	Yes	Yes
Reinke 2008	Yes	Yes	No	Yes	No	No	Yes
Sibieta 2019	Yes	Yes	Yes	Yes	No	Yes	Can't tell
Tunks, 2009	Yes	Yes	No	Yes	Yes	No	No
Van Geel 2017	Yes	Yes	No	Yes	Yes	No	Yes
Williams 2022	Yes	Yes	Yes	Yes	Yes	No	No
Williams 2022	Yes	Yes	Yes	Yes	No	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) Quantitative Descriptive studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	4.1. Is the sampling strategy relevant to address the research question?	4.2. Is the sample representative of the target population?	4.3. Are the measurements appropriate?	4.4. Is the risk of nonresponse bias low?	4.5. Is the statistical analysis appropriate to answer the research question?
Azad 2021	Yes	Yes	Yes	Yes	Yes	No	Yes
Beidas 2012	Yes	Yes	Yes	No	Yes	No	Yes
Bosworth 1999	Yes	Yes	Yes	No	Yes	Yes	Yes
Chang 2008	Yes	Yes	Yes	Yes	Yes	No	Yes
Cheung 2019	Yes	Yes	Yes	Yes	No	No	No
Collier-Meek 2017	Yes	Yes	Yes	No	Yes	Yes	Yes
Connors 2022	Yes	Yes	Yes	No	Yes	No	Yes
Ernst 2009	Yes	Yes	Yes	No	Yes	No	Yes
Fallon 2018	Yes	Yes	Yes	No	Yes	Yes	Yes
Fishman 2018	Yes	Yes	Yes	No	Yes	No	Yes
Flaspohler 2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gagnon 2020	Yes	Yes	Yes	Yes	Yes	No	Yes
Holmes 2022 E	Yes	Yes	Yes	No	Yes	Yes	Yes
Johnson 2018	Yes	Yes	Yes	No	Yes	No	Yes
Kratz 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loman 2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lyon 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Malloy 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Massey Combs 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Melgarejo 2020	Yes	Yes	Yes	No	Yes	No	Yes
Moore 2021	Yes	Yes	Yes	No	Yes	Yes	Yes
Pas 2015	Yes	Yes	Yes	No	Yes	Yes	Yes
Pas 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ruble 2013	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Sichel 2022	Yes	Yes	Yes	No	Yes	Yes	Yes
Suhrheinrich 2020	Yes	Yes	Yes	Yes	Yes	No	Yes
Szeszulski 2022	Yes	Yes	Yes	No	Yes	No	Yes
Trapani 2018	Yes	Yes	Yes	No	Yes	Yes	Yes
von der Embse 2019	Yes	Yes	Yes	No	Yes	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) Qualitative studies only

Author	S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1.1. Is the qualitative approach appropriate to answer the research question?	1.2. Are the qualitative data collection methods adequate to address the research question?	1.3. Are the findings adequately derived from the data?	1.4. Is the interpretation of results sufficiently substantiated by data?	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?
Allen 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alonge 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Andreou 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Anselma 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Arnold 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asada 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bingham 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bridich 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brown 2014	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Burriss 2009	Yes	Yes	Yes	Yes	Yes	No	Yes
Cane 2015	Yes	Yes	Yes	Yes	Yes	No	Yes
Chalkley 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chambers 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Charlton 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chong 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Corboy 2007	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Coyle 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Crane 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dack 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Derrington 2013	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distel 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Elsenburg 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Evans 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fagan 2009	Yes	Yes	Yes	Yes	Yes	No	Yes
Firth 2008	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes
Freeman 2003	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes
Freeman 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frigge 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gale 2020	Yes	Yes	Yes	Yes	Yes	No	Yes
Giraldo-García 2021	Yes	Yes	Yes	Yes	Yes	No	Yes
Goodman-Scott 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gregory 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gunderson 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hadjithoma 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Herman 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Holt 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Hopfenbeck 2015	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes
Hu 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hudson 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Icel 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kannapel 2000	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Katz 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kodish 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leadbeater 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leung 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locke 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lohrmann 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lopez-Yanez 2012	Yes	Yes	Yes	Yes	Yes	No	Yes
March 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marchant 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes
Martinez 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Martinez 2019	No	Can't tell	Can't tell	Can't tell	Can't tell	No	Can't tell
McDaniel 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes
McIsaac 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mendenhall 2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Miedijensky 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mohammed 2008	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes
Mouw 2016	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Murphy 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nielsen 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pearce 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Penlington 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prince 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quintanilha 2013	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robinson 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Runge 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Savage 2011	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Scaletta 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Schildkamp 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Simmons 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Skage 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Smith 2013	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Szeszulski 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Tomokawa 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tyre 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valois 2015	Yes	Yes	Yes	Yes	Yes	No	Yes
Veel 2009	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walker 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wilhelm 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Williams 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Mixed-methods Appraisal Tool (MMAT) Mixed-methods studies (Qualitative and randomised controlled trials)

			1. Qualitative					2. Randomised controlled trial					5. Mixed method studies				
Author	S1	S2	1.1	1.2	1.3	1.4	1.5	2.1.	2.2	2.3	2.4	2.5	5.1	5.2	5.3	5.4	5.5
Foliano 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Hodgen 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	No	No	Can't tell	Yes	Yes	Yes	Yes	Yes	Can't tell
Humphrey 2018	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	Can't tell	Yes	Yes	Yes	Yes	Yes	Can't tell
Humphrey 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Husain 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	Can't tell	No	Yes	Yes	Yes	Yes	Can't tell
Jarke 2020	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	Yes	No	Can't tell	No	Yes	Yes	Yes	Yes	No
Lord 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Can't tell	No	Yes	Yes	Yes	Yes	Yes
Menzies 2016	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	No	No	Can't tell	No	Yes	Yes	Yes	Yes	No
Pampaka 2021	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	No	No	Can't tell	No	Yes	Yes	Yes	Yes	Can't tell
Rienzo 201	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	No	No	Can't tell	Yes	Yes	Yes	Yes	Yes	No
Rose 2017	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Roy 2018	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	No	No	Can't tell	No	Yes	Yes	Yes	Yes	No
Speckesser 2018	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	Can't tell	No	Yes	Yes	Yes	Yes	Can't tell

Stone 2020	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	Can't tell	Yes	Yes	Yes	Yes	Yes	No
Sutherland 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	Can't tell	No	Can't tell	No	Yes	Yes	Yes	Yes	No
Togerson 2016	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	Can't tell	Can't tell	Yes	Yes	Yes	Yes	No

Mixed-methods Appraisal Tool (MMAT) Mixed-methods studies (Qualitative + Non-randomised)

			2. Qualitative					3. non-randomised					5. Mixed method studies				
Author	S1	S2	1.1	1.2	1.3	1.4	1.5	4.1.	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5
Azukas 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Can't tell	Yes	Yes	Yes	Yes	Yes
Davies 2017	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Can't tell
Durand 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes
Greaves 2017	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Griggs 2016	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Gu 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Hardman 2017	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	No	No	Can't tell	Yes	Yes	Yes	Yes	Can't tell
Harland 2021	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell

Hollingshead 2009	Yes	Yes	Yes	Yes	Can't tell	No	Yes	No	Yes	No	No	Can't tell	Yes	Yes	Yes	No	No
Jeffers 2010	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Can't tell	Yes	No	Yes	No	Can't tell	No	No
Nelson 2019	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Can't tell
Oliver 2015	Yes	Yes	Yes	Yes	Can't tell	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Pearlman 2005	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Reumann-Moore 2011	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Speight 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
Walsh-Bailey 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
West 2017	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Ca n't tell	Yes	No	No	Can't tell	Yes	Yes	Yes	Yes	No

Mixed-methods Appraisal Tool (MMAT) Mixed-methods studies (Qualitative and quantitative descriptive studies)

			2. Qualitative					4. Quantitative descriptive studies					5. Mixed method studies				
Author	S1	S2	1.1	1.2	1.3	1.4	1.5	4.1.	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5
Blaine 2017	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Brann 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Casey 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Eisman 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Fisher 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Gabby 2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Garvis 2013	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	Can't tell	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Goldring 2015	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No
Hall 1997	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell	Yes	Can't tell	Can't tell	Can't tell	Can't tell	Yes	No	Can't tell	No	No
Hanckel 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Higgins 2012	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Kaimal 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Lander 2020	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Can't tell	Yes	Yes	Can't tell	Yes	No
Lane 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Leeman 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Levin 2013	Yes	Yes	Can't tell	Yes	Can't tell	No	Yes	Can't tell	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No
Livet 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
McCormick, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
McLoughlin 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Morrison 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Nachmias 2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Ott 2020	Yes	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Can't tell	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	No
Probart 1997	Yes	Yes	Yes	Yes	Can't tell	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Schelvis 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Silveira-Zaldivar 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Sporte 2013	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Can't tell
Warren 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Appendix 18 - Confidence in programme theory elements and ICAMO analysis assessed using Confidence in Evidence from Reviews of Qualitative Research (CERQual) approach

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
Programme theory context: Enabling Structures	95 included studies, see WP3 Evidence Map 2	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	High
Programme theory context: Agents for Change	107 included studies, see WP3 Evidence Map 2	No or very minor concerns.	Minor concerns given overlap between agents for change as a context and their actions relevant to each mechanism.	No or very minor concerns.	No or very minor concerns.	Moderate
Programme theory context: Intervention Features	85 included studies, see WP3 Evidence Map 2	No or very minor concerns.	No or very minor concerns.	Minor concerns about the volume of research that establishes each example of an intervention feature, e.g. core components, complexity, resources and adaptability.	No or very minor concerns.	Moderate
Programme theory mechanism: Uniting	64 included studies, see WP3 Evidence Map 2	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	High
Programme theory mechanism: Reflecting	71 included studies, see WP3 Evidence Map 2	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	No or very minor concerns.	High

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
Programme theory mechanism: Engaging	64 included studies, see WP3 Evidence Map 2	No or very minor concerns	Minor concerns about the distinction between engaging that may involve reflection and be for the purpose of uniting stakeholders	No or very minor concerns	No or very minor concerns	Moderate
4. Conducting local needs assessment	Roach. (2009) Durand et al. (2016) Trapani and Annunziato. (2018) Maxwell. (2019) Hudson et al (2020) Koh and Askill-Williams (2021)	No or very minor concerns	No or very minor concerns	Moderate concerns in relation to the amount of studies that link this strategy to outcomes	Moderate concerns about how well the evidence covers the range of possible local needs assessments that may take place	Low
1. Assess for readiness and identify barriers and facilitators	Desimone (2002) Beidas (2012) Durand (2016) Maxwell (2019) Leung (2020) Gorard (2020) Hudson (2020) Koh (2020) McLoughlin, (2020) Arnold (2021) Flaspohler (2012)	Moderate concerns about the lack of studies that have examined assessing for readiness as a strategy and evaluated its scope and impact.	Moderate concerns about the coherence of enabling structures as a context for assessing readiness but also a response to the assessment	No or very minor concerns	No or very minor concerns	Low
23. Conduct local consensus discussions	Reezigt and Creemers (2005) Tunks and Weller (2009) Gee et al. (2012) Pearson et al. (2015) Frigge et al. (2019) Asada et al. (2020) Herlitz et al. (2021) Shoesmith et al. (2021)	No or very minor concerns	No or very minor concerns	Moderate concern as there is not that much specific evidence about local consensus discussions compared to other strategies	No or very minor concerns	Moderate

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
5. Develop a detailed implementation plan or blueprint	Cane and Oland (2015) Reedy and Lacireno-Paquet (2015) Dyssegaard et al. (2017) Frigge et al. (2019) Alonge et al. (2020) Leung et al. (2020) Stewart (2008) Durand et al. (2016) Moore et al. (2021) Cooper et al. (2015) Leadbeater et al. (2015) Savage (2011)	No or very minor concerns	Minor concern as evidence speaks to a particular aspect of planning rather than coherently showing how the range of components indicated as part of an implementation plan together unite stakeholders' understanding and values about an intervention	Minor concerns as evidence speaks to a particular aspect of planning rather than coherently showing how the range of components indicated as part of an implementation plan together unite stakeholders' understanding and values about an intervention	No or very minor concerns	Moderate
22. Capture and share local knowledge	Leeman et al. (2018) Askill-Williams et al. (2013) Holmes et al. (2021) Ismail et al. (2021) Shoesmith et al (2021) Roney & Daftary (2020) Ikemote al. (2016) Moore et al. (2021) Phillips et al. (2017) Bodilly et al. (1996) McHale et al. (2022) Desimone (2002)	No or very minor concerns	No or very minor concerns	Moderate concern due to limited data demonstrating outcomes	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
57. Involve students, family members, and other staff	Chambers et al. (2020) Frigge et al. (2019) Burris and Ring (2009) Samdal and Rowling (2011) Weist et al. (2019) Grossi et al. (2019) Savage et al. (2011) Sadaji (2021) Van Kuijk et al. (2021) Williams et al. (2021) Humphrey et al. (2020)	No or very minor concerns	Moderate concern regarding findings	Moderate concern regarding data	No or very minor concerns	Low
60. Access new funding	Austin et al. 2011; Carson et al., 2020; Blaine et al., 2017; Dyssegaard, 2017; Evans et al., 2015; Thomas et al 2016; Hung et al., 2014; Lyon et al., 2019; Arnold et al., 2021; Distel et al., 2019; Moore et al., 2021; An et al., 2021; Schelvis et al., 2016; Gu et al., 2021	Moderate concern as there is comparatively little quantitative evidence that indicates the impact of different levels of funding.	No or very minor concerns	Moderate concern. The importance of this strategy is established, yet little evidence provides insights about how to acquire and use funding. There was also a lack of evidence considering how availability of funding might be considered as part of decision making about which approach to select to address a recognised need that both fits the school setting and is feasible.	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
18. Test-drive and select practices	Reezigt and Creemers (2005) Tunks and Weller (2009) Savage et al. (2011) Hall (2013) Goldstein et al. (2015) Durand et al. (2016) Leeman et al. (2018) Icel (2018) van Geel et al. (2017) Frigge et al. (2019) Robinson and Gray (2019) Gale et al. (2020)	Moderate concern regarding the evidence about test-driving approaches	No or very minor concerns	Moderate concern regarding evidence about the strategy	No or very minor concerns	Low
68. Change/alter environment	Nathan 2010, Prince 2018, Florian 2000, Temple University College of Education, Valois 2014, Fagan 2009, Holliday et al. 2009, Dimova et al. 2020, Meixner et al., 2019, Merle et al 2022, Taylor et al. 2018, Connors et al. 2022, O'Hare et al. 2018, Hudson et al. 2020.	No or very minor concerns	Moderate concern because the changes to environment involve both physical adaptations and making time for the intervention and its implementation. It can be hard to distinguish when schools might be using this strategy to allocate time for an intervention on a schedule compared to removing other demands and practices as part of other strategies.	Moderate concern because the changes to environment involve both physical adaptations and making time for the intervention and its implementation. . It can be hard to distinguish when schools might be using this strategy to allocate time for an intervention on a schedule compared to removing other demands and practices as part of other strategies.	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
74. Pruning competing initiatives	Fixsen et al. 2005, Langley 2010, Stallard et al. 2012, Gorard 2016, Salvaterra 1998, Lawrence 2011, Naylor et al., 2015, Johnson et al. 2021, Crane et al. 2021, Locke et al., 2014, Allison et al., 2018.	Moderate concern as there is a lack of evidence that pruning competing initiatives or reducing competing demands for school staff directly increases adoption and sustainability as implementation outcome	No or very minor concerns	Moderate concern regarding adequacy of evidence contributing to the review finding.	No or very minor concerns	Low
26. Identify and prepare champions	Cane (2015) Crane (2021) Firth (2008) Evans (2015) Probart (1997) Quintanilha (2013) Humphrey (2020)	Minor concern due to uncertainties as to how champions may work with other key actors like the implementation team and how many champions there ought to be impacting the coherence of this review finding.	No or very minor concerns	No or very minor concerns	No or very minor concerns	Moderate
28. Inform local opinion leaders	Evans (2015) Atkins et al. (2008) Drmic et al. (2017) McLoughlin et al. (2022) Chambers et al. (2020) Asada et al. (2020) Wolfenden et al. (2017)	No or very minor concerns	Moderate concern due to smaller range of evidence and variation in opinion leaders and outcomes,	Moderate concerns due to smaller range of evidence and variation in opinion leaders and outcomes,	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
34. Recruit, designate, and train for leadership	Williams et al. (2022) Melgarejo et al. (2020) Evans et al. (2015) An et al. (2021) Simmons and Martin (2019) Reumann-Moore et al. (2011) Nelson and O'Beirne (2014) Chang et al. (2008)	Moderate as the evidence tends to speak to the importance of the skills and the principles of distributing leadership rather than evidence that particular training or roles are likely to impact on implementation outcomes.	No or very minor concerns	Moderate concern about adequacy of the evidence contributing to this finding	Moderate concern. Although the strategy is relevant to a range of implementation leadership, rather than school leadership, some of the evidence tends to indicate models for school leaders to support implementation.	Low
48. Create new practice teams	Chambers et al. (2020) Morrison et al. (2019) Freeman et al. (2014) McIsaac et al. (2015) Leung et al. (2020) Higgins et al. (2012) McLoughlin et al. (2020) Lohrmann et al. (2008)	No or very minor concerns	No or very minor concerns	Moderate due to the data that creating the practice team alone would lead to outcomes, rather it is the more specific actions and representation of the team that will impact on outcomes	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
43. Make training dynamic	Blaine (2017) Kennedy et al. (2021) Gregory et al. (2020) Zhang et al. (2022) Moore et al. (2021) Evans et al. (2015) Beidas and Kendall (2010)	No or very minor concerns	Minor concern as making training dynamic and therefore engaging alone is not likely to be sufficient to lead to adoption and fidelity.	No or very minor concerns	No or very minor concerns	Moderate
38. Conduct educational outreach visits	Goldstein (2015) Bingham (2018) Alonge (2020) Austin et al. (2011) Guhn (2009) Brock and Carter (2017) Owens et al. (2019) Walker et al. (2022) Monzalve and Horner (2021) Nunes et al. (2018)	No or very minor concerns	Minor concern as the strategy needs to be considered alongside other professional development strategies rather than in isolation,	No or very minor concerns	No or very minor concerns	Moderate
45. Shadow other experts	McBride et al. (2002) Sims et al. (2021) Walker et al. (2022) Moore et al. (2021) Phillips et al. (2017) Bodilly et al. (1996)	No or very minor concerns	No or very minor concerns	Moderate concern as there are some barriers in terms of resources needed to facilitate this strategy and it is rare that this strategy is used as the only professional development,	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
46. Use train-the-trainer strategies	Walker et al. (2022) Blaine et al. (2017) Cane and Oland (2015) Kisa and Correnti (2015) Alonge et al. (2020)	No or very minor concerns	No or very minor concerns	Moderate concern due to the limited evidence for the impact of train-the-trainer strategies in school settings	No or very minor concerns	Low
41. Develop educational materials 42. Distribute educational materials	Bonnell (2015) Mills (1992) Evans (2015) Livet (2018) Moore (2021) Chen (2018) Calvert (2020) Dariotis (2017) Lord (2017)	No or very minor concerns	Moderate concern as research tended to be more focused on resource availability and format, rather than schools developing or distributing the resources as implied by the strategies.	Moderate concern as research tended to be more focused on resource availability and format, rather than schools developing or distributing the resources as implied by the strategies.	No or very minor concerns	Low
51. Improve implementers' buy-in	Cook et al. (2015) Lohrmann et al. (2008) Brann et al. (2021) Bohanon et al. (2012) Tunks & Weller (2009) Trapani & Annunziato, (2018) Sun et al. (2007) Guhn (2009) Bingham (2018) Grossi (2019) Massey (2021) An (2021)	No or very minor concerns	Minor concern about the coherence of findings specifying how buy-in should be improved.	Minor concern due to an absence of measures to assess buy-in.	No or very minor concerns	Moderate

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
6. Develop and organise quality monitoring system	Hall (1997) Reezigt and Creemers (2005) Tunks and Weller (2009) Goldstein and Olszewski (2015) Robinson (2017) Van Geel et al. (2017) Leeman et al. (2018) Metz et al. (2020) Gale et al. (2020)	No or very minor concerns	Moderate concern because developing the monitoring system alone is not going to impact outcomes in the same way that reviewing the data as part of other strategies can	No or very minor concerns	No or very minor concerns	Low
7. Develop instruments to monitor and evaluate core components of the innovation/ new practice	Schildkamp et al. (2019) Goldenthal et al. (2021) Scaletta & Tejero Hughes (2021) Livet et al. (2018) Oliver et al. (2015) van Geel et al. (2017) Pearson et al. (2015) Gagnier & Fisher (2020) Albers et al. (2021)	No or very minor concerns	Minor concern in relation to the intervention features context. There is data that shows fidelity measures of core components of well-specified interventions but little evidence of how and whether fidelity is measured when these core components are less clear or the intervention is flexible in its delivery.	No or very minor concerns	No or very minor concerns	Moderate

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
39. Conduct ongoing training 44. Provide ongoing consultation/coaching	Lyon et al. (2011) Merle et al. (2022) Stormont et al. (2015) Reinke et al. (2008) Noell et al. (2013) Aragon et al. (2021) Owens et al. (2019) Evans et al. (2015) Samdal (2010) Desomine (2002) Ryan Jackson et al. (2018) Goldenthal et al. (2021) Chambers et al. (2020)	No or very minor concerns	No or very minor concerns	Minor concern as less evidence speaks to reflection as the key mechanism,	No or very minor concerns	Moderate
14. Provide practice-specific supervision 30. Model and simulate change	Ryan Jackson et al. (2018) Albers & Pattuwage (2017) Simmons and Martin (2016) Schildkamp et al. (2019) Hollingshead (2009) Albers et al. (2021) Garvis et al. (2013) Gabby et al. (2017) Robinson & Gray (2017) The Bill and Melinda Gates Foundation (2013) Leis et al. (2017) Merle et al. (2022) Williams et al. (2021) Gaia et al. (2021) Lane et al. (2022) Veal & Bredhauer (2009)	No or very minor concerns	Moderate concerns as there is likely to be variation in terms of how the strategy will be used and the prominence of school leaders as modellers of implementation and supervisors ranges across literature	No or very minor concerns	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
17. Tailor strategies	Fixsen et al. (2005) Roach et al. (2009) Hollingshead (2009) Dyssegaard (2017) van Geel et al. (2017) Schildkamp et al. (2019) Cannata & Nguyen (2020) Moore et al. (2021) Gunderson et al. (2021) Szeszulski et al. (2022) Sichel & Connors (2022)	Moderate concern about the design of studies	No or very minor concerns	Moderate concern as the data rarely specifies how implementation strategies can and have been tailored and that it is this that leads to outcomes.	No or very minor concerns	Low
16. Promote adaptability	Koh & Askeel-Williams (2021) Cannata & Nguyen (2020) Pearson et al. (2015) Herlitz et al. (2020) Savage et al. (2011) Fernandez et al. (2019) Gale et al. (2020) Merle et al. (2022) Cassar et al. (2019) Freeman et al. (2014) Høstgaard Bonde et al. (2018) Gunderson et al. (2021)	Minor concerns as the strategy cannot be considered in isolation as it is informed by other data collection that can inform adaptations.	No or very minor concerns	Minor concern as evidence for the finding because adaptations might look very different across different contexts.	No or very minor concerns	Moderate

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
53. Remind school personnel	Weiland (2018) Botvin et al. (2018) Collier-Meek et al. (2017) Fallon et al. (2018) Oliver et al. (2015) Bishop et al. (2015) Dimova et al. (2021) Dariotis et al. (2017)	No or very minor concerns	Minor concern as it assumes that the reminder is presented in a way that encourages active self-monitoring which was not always coherent in the evidence we located.	No or very minor concerns	No or very minor concerns	Moderate
54. Targeting/improving implementer well-being	Goldenthal et al.(2021) Wolk et al. (2019) Derrington (2015) Larson et al. (2018) Evans et al. (2015) Hodgen et al. (2019)	No or very minor concerns	No or very minor concerns	Moderate concerns as only one small scale study shows the impact of targeting and improving implementer well-being directly.	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
61. Alter and provide individual- and system-level incentives	Hollingshead 2009; Williams et al. (2021) Jago et al. (2015) Karagiorgi (2005) Kaimal and Jordan (2009) Dariotis et al. (2017) Dass (2001) Blaine et al. (2017) Thomas et al 2016; Weist et al 2019; Bishop et al 2015; Austin et al 2011; Cook et al 2019; Kennedy et al (2019); Hung et al (2014); Dyssegaard (2017); Fenton 2002; Evans et al (2015); Guhn (2009)	Moderate concern as there is little evidence to suggest that incentives can work as an implementation strategy in isolation. Also, the cited evidence often conflates incentives with other strategies, such as professional development, resources and acquiring funding	Moderate concern due to methodological concern	Moderate concern due to methodological concern	No or very minor concerns	Low
8. Obtain and use student and family feedback	Alonge et al. (2020) Leeman et al. (2018) Sun et al. (2007) Guhn et al. (2009) Sadjadi et al. (2021) Mendenhall et al. (2013) Mouw (2016) Ott et al. (2020) Temple University College of Education (2010) Valois (2014) Fagan (2009)	No or very minor concerns	No or very minor concerns	Moderate concern due to the relatively small amount of evidence	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
12. Facilitation/problem-solving	Hollingshead (2009) Burgess et al. (2010) Garvis et al. (2013) Hall (2013) Hopkins et al. (2014) Robinson and Gray (2017) Gabby et al. (2017) Ryan Jackson et al. (2018) Azukas, (2019) Albers et al. (2021) Merle et al. (2022)	No or very minor concerns	Moderate concerns as evidence is not coherent in terms of showing how solved problems lead to outcomes that could be replicated.	No or very minor concerns	No or very minor concerns	Low
50. Facilitate relay of intervention fidelity and student data to school personnel	Sun et al. (2007) Anderson-Butcher et al. (2016) van Geel et al. (2017) Robinson and Gray (2019) Trapani & Annunziato (2018; 2019); Michael et al. (2019) Herlitz et al. (2020) Hudson et al. (2020) Gale et al. (2020) Scaletta & Tejero Hughes (2021)	No or very minor concerns	No or very minor concerns	Moderate concerns as evidence is rarely specific about how data is relayed to school staff and there was no evidence about this happening through specific modes of communication as indicated in the strategy.	No or very minor concerns	Low

Review finding	References	Methodological limitations	Coherence	Adequacy	Relevance	CERQual assessment of confidence
32. Organise school personnel implementation team meetings	Judkins (2019) Cheung Kong (2019) Leung et al. (2020) Markette (2013) March, (2020) Miller et al. (2015) Pearlman. (2005) Andreou et al. (2015) Duhon et al. (2009) Freeman et al. (2014) Guhn et al. (2009) van Geel et al. (2017) Fisher et al. (2020) Roy et al. (2018)	Minor concern as evidence is more often qualitative research than reviews	No or very minor concerns	Minor concern due to the variation that might be possible in terms of the reflection, which appears to range from analysis of performance data to sharing concerns. Also, it is unclear what impact this reflection has on outcomes versus other strategies that might be ongoing or if alternative formats to meetings may also be beneficial.	No or very minor concerns	Moderate
10. Stage implementation scale-up	Austin et al. (2011) Comiskey et al. (2015) Bingham et al. (2018) Crawford et al. (2020) Moore et al. (2021) Bogiatzis-Gibbons et al. (2021)	No or very minor concerns	No or very minor concerns	Moderate concern about the adequacy of literature that demonstrates the process of scaling up an intervention and justifies this being planned from the outset occurring.	No or very minor concerns	Low

Appendix 19 – SISTER Strategies not assessed in WP4

Strategy Name	Strategy description	Reason
2. Audit and provide feedback	Collect and summarize data regarding implementation of the new program or practice over a specified time period and give it to administrators and school personnel to monitor, evaluate, and support implementer behaviour.	Considered under #6
3. Conduct cyclical small tests of change (piloting or trialling the practice first)	Implement changes in a cyclical fashion using small tests of change before taking changes system-wide. Tests of change benefit from systematic measurement, and results of the tests of change are studied for insights on how to better implement. This process continues over time, and refinements are made with each to incrementally adjust the new practices to make it more feasible and appropriate for the school context.	Considered under #10
9. Monitor the progress of the implementation effort	Monitor the progress of key implementation outcomes (fidelity, reach of the intervention, acceptability) and adjust practices and implementation strategies as needed to continuously improve the quality of delivery.	Considered under #6
11. Centralize technical assistance	Develop and use a centralized system within a district, region, or state to deliver and facilitate access to technical assistance focused on implementation issues.	Too narrow, lack of evidence
13. Peer-assisted learning	Pair school personnel together, provide them with a training and a validated rubric to observe one another, and have them schedule a debrief session to share findings.	Considered under #32
15. Provide local technical assistance	Develop and use a system to deliver technical assistance focused on implementation issues using local personnel.	Too narrow, lack of evidence
19. Use data experts	Involve, hire, and/or consult experts to inform management and use of data generated by implementation efforts.	Too narrow, lack of evidence
20. Use data warehousing techniques	Integrate educational and administrative data within and between schools and with outside community organizations to facilitate implementation internally and/or across different schools or service settings.	Too narrow, lack of evidence
21. Build partnerships (i.e., coalitions) to support implementation	Recruit and cultivate relationships with partners external and/or internal to the school who help facilitate the implementation effort.	Too broad, lack of evidence
24. Develop academic partnerships	Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project.	Too narrow, lack of evidence
25. Develop an implementation glossary	Develop and distribute a list of terms describing the new practice and its core components, implementation, and the stakeholders who will be involved in implementation effort.	Too narrow, lack of evidence
27. Identify early adopters	Identify early adopters within the school or district to learn from their experiences with the implementation of the new practice.	Considered under #18
29. Involve governing organizations	Involve existing governing structures (e.g., school boards, state-level compliance teams) in the implementation effort, including the review of data on implementation processes.	Lack of evidence
31. Obtain formal commitments	Obtain written commitments from key partners that state what they will do to implement new practices.	Too narrow, lack of evidence
33. Promote network weaving	Identify and build on existing high-quality working relationships and networks within and outside the school, organizational units, teams, etc. to integrate and expand social networks and promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing new practices.	Too narrow, lack of evidence
35. Use advisory boards and workgroups	Create and engage a formal group of multiple kinds of stakeholders to provide input and advice on implementation efforts and to elicit recommendations for improvements.	Considered under #48
36. Visit other sites	Visit sites where a similar implementation effort has been considered successful.	Considered under #22
37. Conduct educational meetings	Hold meetings targeted toward different stakeholder groups (e.g., teachers, principals, central administrators, other organizational stakeholders, and community, and family stakeholders) to teach them about the new practices.	Considered under #57

Strategy Name	Strategy description	Reason
40. Create a professional learning collaborative	Facilitate the formation of groups of school personnel within or between school systems to foster a collaborative learning environment to improve implementation of new practices.	Considered under #32
47. Work with educational institutions	Encourage educational institutions to train school personnel in new practices on a pre- and/or in-service basis.	Too narrow, Lack of evidence
49. Develop resource sharing agreements	Develop partnerships with organizations that have resources needed to implement new practices.	Too narrow, Lack of evidence
52. Pre-correction prior to implementation	Pre-correction is a frontloaded strategy that involves instruction and/or reminders about how to deliver core components of the intervention immediately prior to delivery.	Considered under #42
55. Increase demand and expectations for implementation	Attempt to influence the demand and expectations for new practices, relative to other practices, by educating key stakeholders about the new practice and its associated outcomes.	Lack of evidence
56. Intervene/communicate with students, families, and other staff to enhance uptake and fidelity	Develop strategies with students, families, and other staff who may not directly be involved in delivering the new practice to encourage and problem solve around intervention adoption and fidelity.	Considered under #57
58. Prepare families and students to be active participants	Prepare families and/or students to create “pull” (i.e., motivation or pressure to implement) for the delivery of the new practice by asking relevant questions, advocating for the new practice, and inquiring about guidelines for implementation, the evidence and rationale behind decisions, or about other effective new practices that could be implemented.	Considered under #57
59. Use mass media	Use media to reach large numbers of people to spread the word about new practices.	Too narrow, lack of evidence
62. Alter student or school personnel obligations to enhance participation in or delivery of new practice, respectively	Create structures where students or school personnel are relieved of a particular obligation for participating in or delivering more preferred practices/supports (i.e., new practices) than less-preferred practices/supports.	Similar to #65 and considered under #74
63. Develop disincentives	Provide disincentives (e.g., write up in professional file, meeting with the administrator to discuss insufficient implementation, participation in additional professional development) for failure to implement or use the new practices.	Lack of evidence
64. Fund and contract for the new practices	State departments of education, regional educational networks, local school districts, and other payers of services issue requests for proposals to schools to provide resources for them to deliver new practices, use contracting processes to motivate school personnel to deliver new practices, and develop new funding formulas that make it more likely that school personnel will adopt and deliver new practices.	Considered under #60
65. Make implementation easier by removing burdensome documentation tasks	Make it easier to implement the new practice by removing or alleviating burdensome tasks or documentation (e.g., completing unnecessary and unused data forms, completing rubrics that are not used to inform decisions, reports, etc.).	Considered under #74
66. Change accreditation or membership requirements	Strive to alter accreditation standards so that they require or encourage use of the specific new practice (e.g., proactive classroom management practices, school-wide PBIS, social-emotional learning curriculum). Work to alter membership organization requirements so that those who want to affiliate with the organization are encouraged or required to use new practices.	Too narrow, lack of evidence

Strategy Name	Strategy description	Reason
67. Change ethical and professional standards of conduct	Participate in efforts to reform ethical and professional standards for conduct that encourage school personnel to view delivery of new practices as an ethical responsibility and consistent with the expectations for professional conduct.	Lack of evidence
69. Change record systems	Change data collection systems to allow better assessment of implementation or relevant outcomes.	Considered under #6
70. Change school or community sites	Changing the location of services could enable students to have increased access to new practices.	Considered under #68
71. Create or change credentialing and/or professional development standards	Create an organization that certifies school personnel in new practices or encourage an existing organization to do so. Change governmental professional certification or licensure requirements to include delivering the new practices. Work to alter continuing education requirements to shape professional practice toward new practices.	Too narrow, lack of evidence
72. Develop local policy that supports implementation	Develop local school system policy that establishes rules, expectations, and guidelines for implementation of new practices.	Lack of evidence
73. Mandate for change	Have leadership declare the priority of new practices (i.e., top down) and their determination to have it implemented.	Lack of evidence
75. Start a dissemination/implementation organization	Identify or start a separate organization that is responsible for disseminating and implementing new practices. It could be a for-profit or non-profit organization.	Too narrow, lack of evidence

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