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Risk Management in Research-informed Teaching

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Risk Management in Research-informed Teaching

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Title of project

Risk Management in Research-informed Teaching

Type of project: Survey; institutional case study

Aims of project

To review the research-informed teaching agenda from a risk management perspective across several disciplines within Plymouth University, exploring views from both staff and student stakeholders.

Background to project

The nature of the relationship between teaching and research is of crucial importance and it continues to be a source of controversy and concern in current literature. Interestingly, associated risks of the relationship have been largely overlooked by researchers. This project contributes a novel, epistemological approach to investigate Research-informed Teaching (RiT) by adopting the philosophy of risk management. This approach allows an exploration of both real and perceived risks of RiT from students' and tutors' perspectives, reflecting the analytical process of risk identification, assessment and management.

Research questions & outcomes:

1. *What are the risks of incorporating Research-informed Teaching into distinct disciplines?*

Previous HEA-funded research at Plymouth University suggests that risks exist when using research-informed teaching within the discipline of sustainable building. Are these risks discipline-specific or generic? Outcomes include a risk profile of research-informed teaching and associated characteristics.

2. *Why and how do these risks emerge?* Outcomes establish interactions of risk factors and map risk emergence and associated impact.

3. *Are these risks manageable?* Outcomes identify potential solutions to risk management in research-informed teaching.

Methods

An examination of the corporate and school risk registers and risk management processes was undertaken. An application form was submitted to the Faculty of Arts ethics committee in August 2011 and was approved on 26th September 2011 (See Appendix 1 for ethics information sheet).

A comprehensive literature review was completed in autumn 2011. The review resulted in submission of a review paper (with risk framework) to a leading higher education journal (Teaching in Higher Education) which has received positive referee comments and has been resubmitted after revisions (Appendix 2).

A desk study of research-informed teaching in the disciplines of sustainable building and construction (Faculty of Arts), business and management (Plymouth Business School) and biomedical and biological sciences (Faculty of Science & Technology) considered contemporary practice and helped to identify several individuals engaged with research-informed teaching within these disciplines. This provided the basis for a series of semi-structured interviews undertaken with 5 staff/academics from each of the disciplines and the Associate Deans (T & L) from the corresponding Faculties.

An online questionnaire survey using Qualtrics software was administered to all current students across the three disciplines (n = 2440). The questionnaire consisted of a combination of Likert scale matrix tables, open text entries and single answer multiple choice questions for demographic information, all based around the experiences of planning and delivering research-informed teaching activities within the respective disciplines.

In summary, the data were triangulated by:

1. Data source (university lecturers and 1st, 2nd, placement & final year students)
2. Academic discipline (Environmental Building, Business Management and Biomedical & Biological Sciences)
3. Method (semi-structured interviews and e-questionnaires)
4. Data type (transcribed interview text, open ended survey question text responses and quantitative survey data).

Results

The staff interview data were coded into the following broad themes:

- actual or potential risks to research-informed teaching
- actual or potential management of these risks
- benefits versus risks of doing, or not doing, research-informed teaching
- perceptions of risk within a teaching and learning context

A comprehensive framework of the main risks to research-informed teaching from a staff/teacher perspective has been developed (see Table 1).

Table 1. Core Risks linked to Research-informed Teaching

Core risk categories	Delivery risk factors
<p>Intrinsic Risks Risks identified prior to, or during, the actual practice of research-informed teaching. These may impact on the individual's motivation and/or delivery</p>	<p>Student engagement in research-informed teaching Non-engagement of students in learning activities; possibility of curriculum bias and less focus on knowledge content; students questioning the value of research-informed teaching; teaching methods may not be inclusive; Readers or Professors may struggle to teach at an appropriate level; poor teaching can cause confusion; inconsistent learning experiences across classes or programmes</p> <p>Conflict between professional bodies/discipline and institutional teaching ethos and curriculum Different expectations of graduate attributes; accreditation parameters overly prescriptive; contrasting research priorities; checklist approach vs. critical appraisal of priorities; conflicting ideas on content; vocational vs. academic focus; modules may not count for exemptions</p> <p>Integration of teaching and research affected by disciplinary differences Concerns about student ability to cope with the concepts and principles of research; difficulties of balancing teaching and research interests; different ethical codes; research-informed teaching not properly reflected in workload models</p> <p>Conflict between teaching approaches Conflict between teaching requirements and REF</p> <p>Loss of control Control of learning passes from teacher to student</p> <p>Impact on wellbeing More demanding for teachers: can cause anxiety and frustration (tends to be very contextual)</p> <p>Other factors Time constraints; failure to deliver learning outcomes; negative student feedback; technology failures in specific types of engagement; impact on teacher reputation; use of real data can lead to conflict of interest</p>
<p>Extrinsic Risks Factors external to the individual and the actual teaching process, but can substantially impact on practice</p>	<p>Integration of teaching and research affected by institutional policies and processes Process of effecting curriculum change is cumbersome and prescriptive; lack of consistent definition of research-informed teaching; different agendas at different levels; use of non-specialist teachers; evaluations do not reward effort or recognise value of research-informed teaching; influence of broad strategic concerns over teaching practices</p> <p>Funding mechanisms Novel teaching initiatives often dependent on availability of resources, incl. funding and equipment</p> <p>Staff Attitudes Negative attitudes from colleagues; differing attitudes toward teaching methods (within disciplines); criticism for aligning teaching to industry skills</p> <p>Other factors Institutional and departmental culture can influence level of research-informed teaching; large class sizes may prohibit more innovative practices; student expectations may not be met; diversity of teaching personnel can lead to conflicting opinions and different interpretations of departmental teaching approaches; diversity of learning cultures may complicate delivery</p>

In addition, the main risks to research-informed teaching by discipline were noted based on the frequency at which they were identified by the interviewees.

Table 2. Discipline-based Risks

Environmental Building	Business Management	Biomedical & Biological Sciences
Non-engagement of students	Non-engagement of students	Student's ability to cope
Student's ability to cope	Conflict between accreditation and curriculum	Non-engagement of students
Conflict between accreditation and curriculum	Impact of teacher's own research interests on balance of curriculum	Class size restricts research-informed teaching delivery
Students do not value research-informed teaching		

Further thematic analysis of interview data revealed the following top three teacher strategies for managing a number of the risks listed above:

1. Apply appropriate teaching styles
2. Review and plan course content
3. Foster a sense of cultural support within the discipline

The student online survey achieved a response rate of 10.7% (n = 262). Frequency statistics, reliability tests and regression analysis were performed to determine the specific key risks identified by students (see Table 3 below).

Table 3. Student-identified risks related to learning

Learning Risks Potential risks of research-informed teaching from a student perspective	<p>Level of student engagement in research Need for students to slowly build up skills & confidence to effectively engage; concern that students haven't reached the knowledge maturation level needed to effectively engage</p> <p>Curriculum bias Increased pressure on students to develop their research skills; teaching biased toward own research interests</p> <p>Coping with research engagement Confusion from having to undertake complex literature reviews; harder to access research-engaged teachers for advice and guidance</p> <p>Effect of research engagement on student experience Students experiencing poorly executed ideas for research engagement</p>
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Key risks from a student perspective on their learning experience were determined by a qualitative analysis of open student survey responses on the impacts of engaging in research on learning. This analysis found that two risks (possible curriculum bias and potential negative impact of research engagement on the student experience) had a significant link to the importance students place on research-informed teaching generally. A number of positive and negative impacts of research-informed teaching were revealed, as well as a range of coping strategies students use to manage any negative impacts. These strategies include undertaking additional extra-curricular studies to plug gaps in curriculum teaching, and seeking support from internal and external sources to help them cope with demands and expectations. In many cases, however, it appears a common student response is to do nothing and just 'get on with it'.

Associated publications

Edwards-Jones, A., Gresty, K., Pan, W. and Heffernan, T. (2012) *Research-informed teaching: risks uncovered?* Poster presentation at the Pedagogic Research Institute and Observatory Conference 2012, Plymouth University.

Gresty, K., Pan, W., Heffernan, T. and Edwards-Jones, A. (in review) *Research-informed teaching from a risk perspective*. Teaching in Higher Education.

A further paper incorporating the project findings is in draft format and will be submitted to the *Higher Education Research & Development* journal in early 2013.

Keywords

Research-informed teaching; risk in higher education; risk management; pedagogic research; student engagement

Breakdown of project budget expenditure

All PedRIO funding received (£18,035) went on salary costs for the project's research assistant (A E-J). In addition, extra funding was secured from other sources to pay for transcription services (£100) and Amazon vouchers for student survey incentives (£250).

Appendix 1

Ethics Information Sheet

Risk Management in Research-informed Teaching:

An interdisciplinary enquiry

(For Participants in the Study)

What is this project about?

This project aims to review the research-informed teaching (RiT) agenda from a risk management perspective across several disciplines in the University of Plymouth and other institutions. The disciplines to be studied include:

- Sustainable building and construction;
- Business and management; and
- Biomedical and biological sciences.

The risks will be explored and addressed, taking account of risk variables/factors centred on learning stakeholder, stage of study, discipline, learning curriculum, and learning environment. Drawing on the methods described below, a number of research questions will be addressed:

1. What are the risks of incorporating RiT into distinct disciplines?
2. Are these risks discipline-specific or generic?
3. Why and how do these risks emerge?
4. Are these risks manageable?

Who are we?

The project will be undertaken by Dr Wei Pan (School of Architecture, Design and Environment), Dr Karen Gresty (Science & Technology), Dr Troy Heffernan (Plymouth Business School), and Mr Andrew Edwards-Jones (Research Assistant for the project), at the University of Plymouth.

How will the data be collected?

Semi-structured interviews with five relevant staff/academics from each of the disciplines of the University of Plymouth, at the outset of the project (Month 3-5);

A questionnaire survey with both students and academics in the three disciplines at the university above (Month 6-7);

A questionnaire survey and follow-up semi-structured interviews with academics from the three disciplines at other universities in the UK (Month 8-10);

Semi-structured interviews (over the telephone or internet) with academics in three overseas universities (Month 8-10);

Confidentiality

All information given will be treated confidentially. Published work will always anonymise any responses and never identify the source. Any data generated in the course of this project will be kept securely.

Informed consent and the right to withdraw

Participation is voluntary and you have the right to withdraw from the study, until the time of submitting the questionnaire and/or attending the interview, without prejudice, i.e. whether you participate in this research or not has no relevance to the assessment of the module (applicable to the students only).

Feedback

You may obtain information on our progress or a summary of the findings of the research or a copy of the project report from Wei Pan on wei.pan@plymouth.ac.uk on request or any other academic member of the project team (i.e. Karen Gresty k.gresty@plymouth.ac.uk and Troy Heffernan troy.heffernan@plymouth.ac.uk).

For further information, please contact us via email.

Thank you for your willingness to participate.

Appendix 2

Manuscript re-submitted to ‘Teaching in Higher Education’ after revision addressing referees’ comments (December 2012).

Research-informed teaching from a risk perspective

Abstract

There is now considerable support in the higher education literature for research-informed teaching as a means of improving student learning, particularly where this involves students as co-investigators. Such an approach, however, comes with a number of risks that have received little pedagogic attention. This paper addresses that knowledge gap by advocating a novel approach to research-informed teaching which adopts a risk management philosophy. We review the literature surrounding the challenges of this style of teaching and identify why a risk management approach might be appropriate to addressing some of the inherent issues of research-informed teaching previously reported. Our findings indicate a range of potential risks associated with either the delivery, or non-delivery, of research-informed teaching. We offer a broad framework categorising these risks. Forming the basis of a wider risk management approach, this framework could promote increased reflection and enhancement of teaching practice.

Keywords: research-teaching nexus; research-informed teaching; risk management; pedagogic risk

Introduction

The research-teaching nexus in Higher Education has drawn much pedagogic attention over recent years. As a mode of enhancing the quality of learning, research-informed teaching has become widely adopted in a variety of disciplines yet risks associated with this practice have seldom been considered. A recent study into how research-informed teaching can be enhanced within the environmental building discipline (Pan, Murray and Cotton, 2011) uncovered a number of ‘issues’ that academics potentially face when considering, or delivering, non-traditional teaching methods

(where students are more engaged with research compared to a more didactic style of teaching).

Some of these issues have been described elsewhere in the pedagogic literature using terms such as ‘challenges’ (Castley 2006), ‘barriers’ (Anderson 2007; Pan, Murray and Cotton, 2011) or ‘tensions’ (de Jonghe 2005; Zamorski 2002) but rarely as risks. This prompted the question, could a risk management approach better help educators to identify and manage issues surrounding the deployment of research-informed teaching?

The Higher Education Funding Council for England (HEFCE 2004, p. 24) defined risk as *“the threat or possibility that an action or event will adversely or beneficially affect an organisation’s ability to achieve its objectives”* (HEFCE 2004, p. 24). Huber (2009) commented that this definition provides institutions with an opportunity to focus on positive outcomes as well as negative ones, although most of the types of risk listed by HEFCE lean toward the latter. Furedi (2007) noted that positive terms are seldom associated with risk in the literature and that *“risk is almost always associated with negative outcomes which people are expected to fear”*. Conversely, Power (2009) highlighted how enterprise risk management provides an example of how risks can be considered in a much more positive way. In higher education, consideration of risk could provide additional teaching opportunities and student learning benefits. This article briefly considers the concepts of research-informed teaching and risk management, reviews the available literature surrounding risks associated with research-informed teaching, and finally offers a framework of risk categories that can be used in higher education teaching.

Research-informed Teaching

Various terms are commonly, and often interchangeably, used to describe the concept of research-informed teaching, such as ‘teaching – research relationship’ (Jenkins 2004), ‘teaching – research nexus’ (Elton 2006), ‘inquiry-based learning’ (Healey and Jenkins 2009) and ‘research-based teaching’ (Castley 2006) amongst others. Jenkins, Healey and Zetter (2007) defined the link between teaching and research as *“...the connection between research in the discipline or*

interdisciplinary subjects and student learning in and through those disciplines” p. 6, and stressed the importance of the relationship between staff involvement in discipline-based research and their role as discipline teachers.

Trowler and Wareham (2008) analysed a range of case studies regarding the depiction of the teaching – research nexus in the literature and noted there are “*multiple sorts of linkages and relationships being referred to*” (p. 4). They also criticised the lack of conceptual clarification, listing the various definitions of the teaching-research nexus they encountered as: “*the influence on teaching and learning of students doing research, staff doing research, staff practices being informed by research, the curriculum being informed by contemporary research, the research culture of a particular context and so on*” (p. 5). All these descriptions and definitions reflect learning in which student engagement falls somewhere along a continuum with students as co-investigators at one end and students as an audience for the presentation of research information at the other. This continuum of research-informed teaching is how the term will be used in this paper.

The benefits of research-informed teaching

Jenkins et al. (2007) provided an extensive literature review on the relationship between teaching and research. They also referred to Brew and Boud’s seminal (1995) article, where a call was made to end the ‘unfruitful’ debate about whether there are links between research and teaching and a plea to move towards studies that consider the actual relationship between learning outcomes and research processes. This plea has received growing support from research commentators who have suggested that more useful studies would investigate how these functions could be integrated within teaching practices (Colbeck 1998; Jenkins 2004; Robertson and Bond 2001; Taylor 2008).

The benefits of research-informed teaching are now well documented in the literature (Elton 2006; Healey and Jenkins 2009; Robertson and Bond 2001; Taylor 2008; Trowler and Wareham 2008; Visser-Wijnveener et al. 2009). Some of these benefits include empowering and enthusing students, enhancing academic credibility, strengthening bonds between educators and students,

generating new research ideas and providing insights into what researchers do (Lips 1999; Neumann 1994).

The challenges of research-informed teaching

Grant & Wakelin (2009) recognised that much of the material related to research-informed teaching assumed a ‘harmonious connection’ between teaching and research, implying that this connection can be easily managed. The literature, however, provides many examples which challenge this connection and so potentially threatens a successful nexus. Spronken-Smith, Walker, Batchelor, O'Steen and Angelo (2011) carried out a meta-analysis of 10 cases of inquiry-based learning, identifying factors that enabled and constrained its use. They found that teacher responses to the introduction of inquiry-mode teaching included fear and anxiety, primarily due to the relinquishing of control. Such responses need to be carefully anticipated and managed, to ensure good staff morale and an enhanced student experience.

Lips (1999) recognised that teachers can lose control of the research process by encouraging students to be partners in the activity. This loss of control can potentially lead to unexpected positive outcomes, as well as following different threads to those envisaged. However, students may struggle with the process, obtain little useful data and end up with a negative perception of research. Lips (1999) revealed that her study exposed students to real risks associated with face-to-face research e.g. that recruiting participants can be fraught with difficulty and can cause frustrations. Such issues are part of doing ‘real’ research and provide a genuine insight into the process but may not be anticipated and so need sensitive handling when they arise.

A recent qualitative case study by Pan, Murray and Cotton (2011) presented staff and student perspectives on the implementation of research-informed teaching initiatives within one post-1992 UK University’s Sustainable Building and Construction programmes. From interviews and focus groups with academic staff, recent graduates and existing students, the authors found that, overall, research-informed teaching was well regarded as a method for enhancing student learning

but a number of barriers to implementation were identified by each group. The main issue for staff involved time conflicts, both in terms of balancing their own roles, and also trying to ensure balance of content and process within the curriculum. Other barriers included: greater inconsistency of student learning, a paradox of 'education of building' versus 'education for building', large class sizes, unhelpful on-going debate about the teaching-research nexus, and complex processes for revising a curriculum. Students also flagged up key issues, including a greater emphasis on research at the expense of industry-desired practical skills, enthusiastic tutors utilising their own research in teaching at the expense of other peer-reviewed work, and the possible counter-productivity of poorly executed teaching ideas. Pan, Murray and Cotton (2011) condensed the results from the different data groups to suggest a range of strategies for addressing these matters, situated within the context of the discipline and institution. These strategies involved: improving understanding of research-informed teaching within the discipline; better guidance and support from the institution and higher education community on implementation; reflection on policies, culture, practices and values to identify gaps in delivery processes; strong leadership to maintain equal quality in teaching and research, as well as increasing confidence within teaching; and support for individual academics, including reward systems that recognise and encourage a 'step-change toward more research-informed teaching'. Student involvement in this study helped to identify multi-stakeholder strategies to address the issues encountered. Neumann (1994) also highlighted criticisms from students in her research on the teaching-research nexus. These included some similar concerns regarding academics that emphasised their own research activities and area to the detriment of the intended course curriculum.

Healey and Jenkins (2006) noted other challenges when claiming that both the nature and opportunity for research-informed teaching were likely to be influenced by a range of factors, such as the willingness of staff to engage in such teaching as well as the pervading teaching culture within departments or institutions. Badley (2002) suggested that teachers may stick with their traditional and predictable approaches, rather than adopt a delivery style that is characterised by

“uncertainty, unpredictability, contestability and challengeability” (p. 450), even where such characteristics may be necessary to develop student growth to cope within a complex world. Healey and Jenkins (2006) also suggested that students may need to be convinced of the benefits of unfamiliar research-informed teaching for their learning. The sense that students may not always fully support this form of teaching was also taken up by Brew (2007), who claimed there is some evidence that students who engage in problem-based learning do not rate their curricula as highly as more traditional approaches, suggesting it takes time for students to adapt to this style of learning. Students have been found to struggle with the expectations that arise from taking greater responsibility for their own learning, a process likened to the ‘grief curve’ (Spronken-Smith et al. 2011). In discussion of ‘student-centred instruction’, Costello, Brunner and Hasty (2002) noted the transition from traditional teacher-led learning to an independent learning style can initially create problems for students, such as trauma, grief, shock and denial as they grapple with increased responsibility.

From this review of risks, a picture has emerged which presents an argument that the greater the participation of students in research-based initiatives, the more likely there are to be risks involved to a successful learning experience, and therefore a greater possibility that innovative teachers might be deterred from implementing their ideas in the first place.

Such threats to innovation have been discussed within a body of work from the Council on Undergraduate Research (CUR) during the last decade (Karukstis and Hensel, 2010; Wenzel, 2003). This debate has mostly taken place within the context of initiatives promoting undergraduate research in Predominantly Undergraduate Institutions (PUI) in the US. Many of the identified risks to innovative teaching align with those previously discussed in this paper i.e. time constraints, balance of teaching loads, insufficient facilities, inexperienced students as collaborators, and hostile research-for-the-elite-only cultures. A range of mitigating strategies have been implemented and reported (Karukstis and Hensel, 2010), many focusing on resource allocation as the principle solution to overcoming these risks (Rich, 2003).

Having exemplified a number of challenges to the practical application of research-informed teaching, does the literature provide any insight into how they might be systemically addressed?

Calling for a risk management approach to enhancing research-informed teaching

Although a range of strategies aimed at enhancing and strengthening the teaching-research nexus has emerged over the last few years, often based upon an international body of research and collated experiences (Brew 2006; Griffiths 2004; Healey 2006; Healey and Jenkins 2006; Jenkins et al. 2007) and institutional case studies (Webster and Kenney 2011; Zubrick et al. 2001), there is scant evidence amongst these that the issues identified in relation to the development of the nexus have been considered in terms of risk and risk management. Has this research community missed a chance to apply a new approach to creating and developing opportunities for strengthening research-informed teaching?

Risk and risk categorisation

Risk is defined by The Royal Society as *“the probability that a particular adverse event occurs during a stated period of time, or results from a particular challenge”* (Paulsson 2004, p. 79). This definition reflects the commonly portrayed view in the literature of risk as a negative phenomenon. A more positivist version of risk is provided by the International Organisation for Standardisation (ISO) as *“the combination of the probability of an event and its consequences”* (Woods 2011 p. 22). This interpretation allows the impact of opportunities to be considered as well as threats, also noted by other authors (Project Management Institute 2008; Zou and Li 2010).

It is common in the literature to find risks categorised or grouped according to their source, with Woods (2011) highlighting that this practice makes risks easier to identify and manage. One common grouping divides risk into three categories: financial, operational and environmental (Woods, 2011) with variations on the weighting and relative importance of the categories depending

on the nature of the business (Norrman and Lindroth 2004; O'Hehir 2001; Ritchie and Brindley 2004; Verbano and Venturini 2011). This approach has also been used in the public sector, with the UK Government's Department of Culture, Media and Sports (DCMS) dividing its common risks into three source categories: externally-driven, operational and change (Woods 2011, p. 114). Within higher education, in line with HEFCE governance requirements, each institution has its own method of highlighting risk categories. For example, Huber (2011) commented that the University of Bath has eight risk groups relating to various areas of responsibility, whereas many others:

structure risk registers as in layers of an onion, distinguishing core risks, organisational risks and external risks. The core risks concern teaching and research. Around this core, we find organisational or delivery risks that emerge when managing the provision of teaching and research (p. 8).

Using this structure of recording risks, Huber (2011) further examined institutions' risk registers and highlighted 'teaching risks' which he found tended to focus on teaching from contextual viewpoints rather than on actual innovative teaching practices i.e. student perceptions, and impact on an institution's market position. It was also noted that many of the more specific sub-risks specifically excluded any items that might attempt to ease tensions between teaching and research obligations. Huber claims that teaching cannot be managed directly; hence universities rely on indicators such as class size, and number of part-time teachers to highlight threats to practices. However, if a risk management approach is adopted then some of the teaching threats identified by Huber could perhaps be more effectively identified and managed.

Risk management

Establishing categories helps organisations develop a formal structure for a risk management system, aided by the use of risk management standards to outline key principles, frameworks and processes) relevant to a particular organisation (Woods 2011). Higher education institutions are additionally informed by HEFCE good practice guidance (HEFCE 2005) with a focus on specific academic risk.

Risk management can be defined as the *“process whereby decisions are made to accept a known or assessed risk and/or the implementation of actions to reduce the consequences or probability of occurrence”* (Norrman and Lindroth 2004, p.22). HEFCE’s interpretation adds an aspirational element to the definition, to stress that risk can be managed in a way that enhances beneficial achievements: *“Risk management is a process which provides assurance that objectives are more likely to be achieved, damaging things will not happen or are less likely to happen, and beneficial things will be or are more likely to be achieved”* (HEFCE 2001a, p. 5). The most dynamic element of a risk management system is the risk management process, comprising combinations of the following stages: identification, assessment, analysis, evaluation, treatment, communication, monitoring and review (Hallikas and Virolainen 2004; Woods 2011).

A range of techniques can be used for implementing the stages of the risk management process (Hallikas and Virolainen 2004; Verbano and Venturini 2011). Risk analysis is usually presented on a matrix that plots the likelihood of a risk occurring against the impact of that risk, with graded scores being awarded from low to very high (Hallikas and Virolainen 2004). Huber (2011) distinguished between two contrasting approaches to risk analysis in universities. One form is a ‘simple’ approach that represents risk numerically, whilst the other operates an ‘extended’ approach where institutions identify risk likelihood and impact but also embed the risk assessment into their overall strategic management.

The main outcome of risk assessment is typically a risk register, providing a brief description of the risk, the person responsible, the risk analysis, how it should be treated and the residual risk that remains after ‘treatment’. Actions to reduce the consequences of risk occurrence can include one of a number of treatments, such as avoidance, reduction, transferral or acceptance (Sawczuk 1996; Woods 2011). An organisation’s risk management details should be clearly communicated to internal stakeholders and regularly monitored and reviewed (Woods 2011).

The case for risk management in higher education

Verbano and Venturini (2011) described how risk management first took hold in the US in the 1950s mostly to reduce insurance losses from pure risks e.g. fire. During the 1980s, risk management techniques were developed beyond insurance purposes (O’Hehir 2001). In the 1990s and early twenty-first century risks associated with business started to move to the forefront of management practice (Paulsson 2004), largely as a result of legislation requiring risk assessments and from increasing threats to information and people e.g. terrorism, natural disasters. Risk management also became a tool for enhancing performance rather than just minimising financial loss (Verbano and Venturini 2011).

Drawing on good practice from other sectors, the higher education sector has been implementing formal risk management procedures since 2000. According to HEFCE (2005) there are demonstrable benefits aligned to such procedures and institutions adopting risk management protocols are more likely to have tangible benefits as a result. For example, risk management allows greater consistency across institutional practices and opportunities (particularly from information on identified resources and linked stakeholders) are more likely to be identified, assessed and taken due to the systematic processes that form part of the risk management framework. The research that informed HEFCE’s guide additionally found that risk management aided better management of projects and initiatives, facilitated better cross-institution working, and fostered a greater awareness of activities and initiatives throughout institutions (HEFCE 2005). The report stressed that these benefits were more likely to be realised if risk management was integrated into existing processes. By doing so, staff members are more likely to be sold on the general approach and less likely to see it as a 'bolt-on', with associated credibility issues, plus implementation might be more economical in cost and time than if dedicated processes were introduced. HEFCE (2005) suggested one of the most effective of these processes would be strategic planning, which links back to Pan et al's (2011) conclusions that research-informed teaching was evidenced very much at the operational teaching

level but suffered from a lack of strategic support at the programme and course level. Clearly, there is a case for integration of risk management and research- informed teaching processes within faculties and departments, involving existing staff in managerial positions.

It should be noted that risk management is not universally lauded as an organisational framework. Furedi (2007) claimed that *“Through risk management, fear is institutionalised and the fear response is further encouraged and culturally affirmed”*, while Power (2009) criticised the growth of the *“risk management of nearly everything”* over the last decade, claiming that the concept has become *“less about managing risk as it is formally understood and more about creating organizational rhythms of accountability and auditable representations of due process”* (p. 854).

Elsewhere though, reviewers claim that risk management can provide mechanisms to control both the positive and negative aspects of risk (Woods 2011) and provide an approach to decision-making that can help individuals or organisations ‘avoid intolerable outcomes’ (O’Hehir 2001, p. 29).

Returning to Huber's (2011) summary report on academic risk in UK universities, although there was an acknowledgement that the limited sample size of the study prohibited sweeping suggestions for implementing risk management, the author does usefully conclude that risk management could be utilised as a method to facilitate and improve decision making if it is not confined within the realms of regulatory policy making. Support for this approach can be found in a HEFCE (2001b) statement:

when used well, risk management can actively allow an institution to take on activities that have a higher level of risk (and therefore could deliver a greater benefit) because the risks have been identified, are understood and are being well managed and the residual risk is thereby lower.

Therefore we suggest that if (or where) teaching and learning activities are recognized as having risk attached to them, risk management processes could be used constructively in planning and

delivery. This could apply not only to higher education but also when research-informed teaching methods are employed in any educational context.

Risks and research-informed teaching

An explicit consideration of risk in research-informed teaching might enable an understanding of potential barriers and challenges in advance of an initiative being introduced, thus allowing some form of mitigation to be applied to minimise any negative impacts. Zetter (2002) suggested that one way to enhance research-informed teaching is by conducting a “*departmental SWOT analysis that can be used to examine such things as curricula dealing with research-based and research-led learning; management, organisation structure and staffing; and cultures of inclusiveness or exclusiveness*” p. 12. The management implications of the teaching-research relationship have also been considered by Taylor (2007). He classified management responses as being active (pursuing the interaction between teaching and research to counter threats e.g. funding, competition) or passive (removal of practical obstacles to the teaching - research nexus, allowing for staff innovation). Such a management perspective bears strong similarities to a risk management approach.

Snyder (2003) claimed that risk is the major barrier to active learning, with risks that include students not using higher order thinking skills, nor learning sufficient content and the associated risk that staff members feel “*a loss of control, lack the necessary skills, or be criticized for teaching in unorthodox ways and not covering the same amount of material as before*” (p160). Snyder suggested ways in which these risks can be minimised and presents a matrix that consists of four key influences on active learning: instructor preparation, risk, student commitment and level of control. In this matrix, as an example, a student-controlled project is shown as requiring high levels of instructor preparation and student commitment, and attracting a high degree of student control and risk. A traditional lecture is presented in exactly the opposite way. The matrix can be used by educators to consider the trade-offs alongside the various levels of preparation, and management

strategies can be plotted and adopted in accordance with the level of risk-seeking or risk-aversion of the individual or institution.

Following a review of a number of research papers, Henkel (2004) cautioned against the adoption of research-led teaching for all students in a massified higher education system, claiming uncertainty over the effect of this form of teaching on student motivation. It has also been found that academic staff are likely to exercise far more caution in implementing research-informed teaching methods where there is an overly risk-averse organisational culture (Castley 2006; Hughes 2003). It would appear therefore, that there are a variety of potential risks of adopting or avoiding research-informed teaching and that a mechanism or framework to enable wider consideration of such risks could be a useful tool for university educators.

A categorical framework of risks related to research-informed teaching

One starting point for developing a categorical risk management tool for research-informed teaching is to provide a summary of the issues that have been previously reported in the literature in relation to the delivery of research-informed teaching. Drawing on the risk management process outlined earlier, and specifically giving consideration to risk register formats and terms described by Huber (2011), Woods (2011) and Zou and Li (2010), these issues were placed by the authors into a simple constructed framework of risk categories so that the ‘identification’ stage of risk management can be fulfilled. Table 1 shows a broad division of risks into three categories:

- (1) Intrinsic risks include those that lie within the actual teaching practice, such as those emanating from curriculum design, lesson planning, delivery in the classroom, and quality of teaching;
- (2) Extrinsic risks are those that impact on the teacher from outside of the explicit teaching process i.e. institutional policies, Government directives, economic climate and;

- (3) Learning risks are those identified from the student perspective, for example where research engagement may impact on a student's overall learning experience, or where individual's may struggle to cope with additional demands of research-based learning methods.

This framework may help teachers to relate the risk categories or risk factors to their own current or proposed research-informed teaching practice. This exercise can then pave the way to the next stages of the process, involving risk assessment, intervention (treatment), evaluation and review to complete the risk management cycle.

Table 1. A framework of constructed risk categories showing the main risks to research-informed teaching (terms in inverted commas reflect the actual descriptions of cases or situations from the original academic references).

Insert Table 1 here

Conclusions and recommendations for future research

The debate regarding the balance between teaching and research in higher education and the merits of linking the two shows no sign of abating, particularly as the move towards a more student-centred approach and a greater emphasis on teaching quality and accountability look set to strongly influence this relationship (Anyangwe 2011). This paper has identified a number of issues that threaten this relationship and suggests how the concept of risk and associated management processes could be applied to enhance research-informed teaching, via the consideration of a categorical risk framework.

There is scant evidence of higher education studies focusing on risk management from a non-financial perspective (Huber 2009), and research that explicitly links risk management and research-informed teaching is even rarer. It is recognised that, when applied to higher education, there is a danger that risk management could actually become a barrier to developing teaching

practice rather than providing an opportunity, particularly if it focuses solely on negative outcomes. However, where individuals have a more adventurous or innovative outlook to their teaching, for example where roles are redefined and students are encouraged to become co-investigators and co-producers of knowledge, they are likely to be drawn to risk and could even be motivated by it, enjoying the experience of the unknown (Garland 2003). Risk management could offer a potential outlet to highlight such opportunities to these individuals. This approach could also be utilised as an effective tool in higher education for developing students if they are invited as partners into the 'risk' activity, enabling them to experience and potentially develop skills which are valued by employers such as critical thinking, independent thought, and project management involving uncertain outcomes.

In an attempt to explore the usefulness of this approach to enhance research-informed teaching, a study is underway at one UK HE institution. It addresses both real and perceived risks of research-informed teaching from students' and tutors' perspectives, reflecting the analytical process of risk identification, assessment and management. The research focuses on three separate disciplines (Sustainable Construction, Biomedical and Biological Sciences, and Business Management) to enable triangulation of results and to assess wider validity and applicability. Initially an institutional study, the hope is that it will then expand to consider other universities providing a sector-wide perspective of the risks involved in research-informed teaching and how to effectively manage them.

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Table 1. Literature-derived Risks (from Submitted 'THE' Manuscript).

Core Risk Categories	Delivery Risk Factors	Academic References
Intrinsic Risks Risks identified prior to, or during, the actual practice of research-informed teaching. These may impact on the individual's motivation and/or delivery.	<p>Integration of teaching and learning affected by disciplinary differences Links between research and teaching 'challenging'; 'barriers' in integrating students into departmental research community; disciplines impose and regulate rules and codes; disciplinary communities differ in attitudes to roles; different research maturation among students from different disciplines; 'difficult' to integrate research with teaching</p> <p>Student engagement in research-informed teaching 'Barriers' to bridging the research-practice gap; absence of well-developed self-regulatory skills; students question the value of research-informed teaching; 'concern' about students' intellectual maturation vs. ability to do research required; 'barrier' to active learning; takes time for students to engage; 'risk' that the students fail to learn the designated content; 'problems' for students with increased responsibility; inconsistencies in student learning</p> <p>Conflict with industry/discipline Non-take up of research results by industry; 'tensions' between professional bodies' curriculum expectations and research-informed teaching; 'curriculum creep'; 'less opportunities' to link specialist research interests into the curriculum; 'barriers' to implementing research-informed teaching; integration of teaching and research 'limited' by learning requirements of professional bodies</p> <p>Conflict between teaching approaches 'Tension' between teaching obligations and REF requirements; following specialist approach to either teaching or research creates 'barriers' to active learning</p> <p>Loss of control 'Unpredictability' of research and class direction; 'danger' of loss of control</p> <p>Impact on wellbeing Fear, anxiety and stress in individuals; factors that enabled and 'constrained' inquiry-based learning</p> <p>Other factors Conflict between individual and organisational goals; negative evaluations; time constraints; uncertainty of benefits; loss of reputation</p>	<p>Brew, 2007; Colbeck, 1998; Griffiths, 2004; Healey & Jenkins, 2009; Hughes, 2003; Robertson & Bond, 2001; Zamorski, 2002</p> <p>Anderson, 2007; Brew, 2007; Castley, 2006; Costello <i>et al.</i>, 2002; Healey & Jenkins, 2006; Hughes, 2003; Jenkins, 2004; Lips, 1999; Pan <i>et al.</i>, 2011; Snyder, 2003; Spronken-Smith <i>et al.</i>, 2011; Zamorski, 2002</p> <p>Durning & Jenkins, 2005; Griffiths, 2004; Healey & Jenkins, 2009; Pan <i>et al.</i>, 2011; Taylor, 2008</p> <p>Huber, 2011; Snyder, 2003; Taylor, 2007</p> <p>Grant & Wakelin, 2009; Lips, 1999; Snyder, 2003</p> <p>Spronken-Smith <i>et al.</i>, 2011</p> <p>Anderson, 2007; Brew, 2007; Durning & Jenkins, 2005; Henkel, 2004; Huber, 2011; Pan <i>et al.</i>, 2011; Ryder, 2002; Taylor, 2008; Zubrick <i>et al.</i>, 2001</p>
Extrinsic Risks Factors external to the individual and the actual teaching process, but can substantially impact on practice.	<p>Resistant attitudes 'Conspiracy for safety'; attitudinal 'barriers' inhibit research training; 'impediment' to the nexus by highlighting 'teaching loads' and 'research opportunities'</p> <p>Institutional policies 'Limitations' in the reward system; 'lack' of internal resources; inconsistent understanding of research-informed teaching; attitude to risk</p> <p>Funding mechanisms 'Pressures' on funding make integration hard to sustain</p>	<p>Badley, 2002; Brew, 2006; de Jonghe, 2005; Elton, 2006; Healey & Jenkins, 2006; Webster & Kenney, 2010; Zetter, 2002; Zubrick <i>et al.</i>, 2001</p> <p>Brew, 2006 & 2007; de Jonghe, 2005; Healey & Jenkins, 2006 & 2009; Hughes, 2003; Pan <i>et al.</i>, 2011; Taylor, 2008; Zetter, 2002; Zubrick <i>et al.</i>, 2001;</p> <p>Taylor, 2007; Zubrick <i>et al.</i>, 2001</p>
Learning Risks Potential risks of research-informed teaching from a student perspective	<p>Poor student experience 'Poor execution' of ideas by teacher; insufficient training of teachers; teaching is 'biased' toward teachers' own research area</p> <p>Uncertainty of benefits</p> <p>Other factors Less access to teachers, less time spent on practical skills and subject knowledge, increased pressures on student research skills, and greater confusion from complex literature searches</p>	<p>House of Commons, 2009; Huber, 2011; Neumann, 1994; Pan <i>et al.</i>, 2011; Snyder, 2003; Trowler & Wareham, 2008; Webster & Kenney, 2010</p> <p>Henkel, 2004</p> <p>Anderson, 2007; Jenkins <i>et al.</i>, 2007; Pan <i>et al.</i>, 2011</p>