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Actor training underwater in the future

John Matthews

An account and report on the findings of the Story Futures funded research project, Watercourse: Actor Training and Virtual Production in Immersive Dome Spaces, with project partners, Theatre Royal Plymouth and Hi9 Natural Language Agency. The research, testing the potential of emergent virtual production and immersive technology to ‘Queer Time’ actor training in the near future, took place at Devonport Market Hall immersive dome; a 15-metre world-class immersive projection space in Plymouth. Testing the integration of technology in training was not intent on developing actor training methodologies specifically for immersive performance or virtual production; the enquiry was into the potential for integrating new technology into extant approaches now and the near future to address current concerns about specific areas of actor training practice.

Keywords: actor training, virtual production, immersive, digital technology, Meisner, future

Table Work (Underwater in the Future)

Sanford Meisner would appear to have taken a very literal approach to what has been called table work, or ‘work on the play around a table’ (Mitchell 2009, 142) – he used an office desk in his actor training studio and taught his eponymic ‘Meisner Technique’ from behind it and sometimes on top of it. In a recent research project using experimental dome immersive and virtual production technology in Meisner Technique actor training, I took the table out of the studio and used it as a remote piloting station for driving 3D models and digital assets. Moving the desk out of the training work-space was part of a series of experimental interventions discussed in this article aimed at making Meisner Technique actor training more inclusive, prototyping new ways of working with immersive and virtual production technology in actor training more broadly (Figures 1 and 2).



Figure 1 Sanford Meisner teaching acting classes 1950s–1980. Precise dates and photographers unknown. Centre image can be loosely dated to 1950s by presence of young Robert Duvall in first row.



Figure 2 Perspectives on the remote physical workspace from which digital assets are piloted in UnReal.

The desk no doubt served a practical purpose for Meisner and perhaps a symbolic one too: recalling the proxemics of a casting call or screentest the table-as-barrier manifests the power dynamic at play in ways that underscore the ‘acknowledged trope in actor training’ of the “guru” or master teacher’ (Pearlman and McLaughlin 2020, 318), especially in the context of the ‘American School’ of ex-Group Theatre-member teachers including Strasberg, Adler, Meisner¹. According to records, Sanford Meisner, although physically diminutive, taught as a prominent physical presence in the workspace and the limited photographic evidence and audio-visual recordings of Meisner teaching attest this fact.

Footage of a 1984 PBS special, *Sanford Meisner: Theatre’s Best Kept Secret* made late in Meisner’s life after he had undergone surgery effecting his speech, show him teaching from behind a desk. In the footage, Meisner facilitates exercises with instructions and verbal interjections. Although facilitating non-verbally is commonplace in actor training it is unconventional in Meisner Technique. While Meisner teachers might prompt or respond to participants’ action, or underline and enforce verbal instruction with physical gestures and body language, many teachers emulate Meisner’s highly linguistic ‘charismatic acting teacher’ (2020, 317–21) style. Several scholars have critiqued elements of this style based on the oppressive and potentially abusive effects of ‘guru’ teachers. Susan Ogden-Malouf notes how asymmetrical power dynamics in actor training, which are symbolically reinforced and proxemically mapped by affectations such as the desk, can pave ‘the way to both psychological and sexual exploitation’ (in Malague 2012, 1–2). More recently, Meisner

¹ Feminist scholar Susan Ogden-Malouf provides this warning: “‘Method’ acting, as it’s traditionally taught, asks the performer to align with a part, to search for those self-revelations appropriate to a role. The acting coach or director frequently serves as an all-knowing guru for whom the performer must be absolutely vulnerable” (in Malague 2012, 1–2).

Technique teachers Lazlo Pearlman and Diedre McLaughlin have critiqued predominant teaching approaches in this training tradition based on their heteronormalising effects. They argue the propensity of teachers to facilitate exercises in the format of ‘scenes’ centralises language commands as the key teacher-student communication modality and derives character and narrative via normative assumptions and modes, governing the actions of participants within circumscribed units of ‘chronormative’ time. Adopting Elizabeth Freeman’s term, ‘chrononormative’ – a ‘use of time to organize individual human bodies toward maximum productivity’ (Freeman 2010, 23) – they identify the chrononormalising effects of teachers’ language-use. Describing Meisner trainers ‘call[ing] cis-heteronormativity into the space’ impelling students to ‘fall into a “narrative coherence” of heteronormative relationships’ (Pearlman and McLaughlin 2020, 321), they identify ‘instruction’ (2020, 310, 311, 314, 315, 317, 320) – language commands delivered by a ‘guru’ teacher – as central to the chrononormalising effects of actor training.

They assert that, despite this situation, Meisner exercises are concerned with an interpersonal free-play of feeling and representation not bounded (at least conceptually) by normative temporal codes and modes, which, in everyday life, foreclose open-ended possibilities and channel these into normative temporal-narrative forms:

‘despite and at the same time because of these parameters, inside the repetition exercise normative logics of time and conversational dialogue disappear. Time stretches and shrinks and “narrative coherence” stretches and shrinks with it’ (316).

They hypothesise that actor training could be ‘Queer Timed’:

‘we know Meisner and other canonical acting techniques to be historically rife with cis-heteronormative tendencies, and yet we are convinced that Meisner still has the possibility to offer something powerful to many students of acting and performance...there is the potential for Meisner repetition to be reimaged and reassembled by, in and as Queer Time’. (Pearlman and McLaughlin 2020, 323)

In response to this hypothesis, *Watercourse: Actor Training and Virtual Production in Immersive Dome Spaces* was designed to experiment with and test practical means to remodel actor training exercises, testing the viability of using immersive and virtual production technology to address some of the concerns identified by Pearlman, McLaughlin and others. Moving the table out of the studio and utilising it as part of an interactive facilitatory tool was one aspect of *Watercourse*’s experimental approach to using emergent technology to address some of the ethical and artistic concerns raised about charismatic acting teachers’ style.

Watercourse project design: designing and testing practical solutions

One practical response explored in *Watercourse* to the problems of language and the time-bound structures and experiences that it can

impute in Meisner Technique was to develop means whereby language was less essential to exercise facilitation and to the development, motivation and direction of the evolving relationships between participants in training.

One set of project workflows experimented with the potential to 'Queer Time' Meisner Technique by testing the abilities of immersive and virtual production technology to reduce and replace language-use by teachers. This might also avoid the over-determining effects of normative socio-cultural conventions of conversational etiquette which also beset Meisner Technique exercises specifically; facilitating a 'non-quotidian' environment in which to practice might support and promote the exploration of non or anti-normative thinking and action.

Pearlman and McLaughlin have argued that there are specific identity-related problems introduced into the embodied experience of the exercise for participants by the verbal intervention of a teacher with the status of 'all knowing guru' (Ogden-Malouf in Pearlman and McLaughlin 2020, 318).

The 'problems' identified in the research context as inhibiting or constraining the Queer Time potential of actor training exercises were concerned with-

1. the subjectivity and influence of the teacher in the training workspace
2. the status and use of language in the exercise and, somewhat paradoxically,
3. the everyday familiarity of the content of the exercises.

Considering these problems and the latent potential purportedly inherent in Meisner Technique, *Watercourse* established three objectives that would determine project workflows²:

1. To use immersive technology and virtual production techniques to decentralise the conspicuous authority of the teacher in facilitating the exercise
2. To use immersive technology and virtual production techniques to decentralise language-commands in facilitating exercise
3. To utilise immersive technology and virtual production to construct and maintain an interstitial space-time in which sustained relational encounters could occur

Achieving these objectives required specific skillsets in the project team and access to relevant technology and technologically equipped spaces. With funding from StoryFutures Academy, I convened with a project team including University of Plymouth researchers, Andrew Prior, Associate Professor of Digital Art & Technology, Joel Hodges, Lecturer in Game Art and Design, Musaab Garghouti, Lecturer in 3D Visualisation, Immersion and Simulation as well as Lauren Hayhurst, Head of Narrative Design at Hi9 Natural Language Agency. This team had expertise across actor training practice and theory, 3D model building, game design, immersive design and narrative design as well as technical expertise in sound and image recording and game engine development³. In a recruitment process facilitated by Producer, Luke Mosely, we worked with Theatre Royal Plymouth's Head of Artist Development, Ben Lyon Ross, and his project team to recruit two actors, one from Theatre Royal

2 The project also set research objectives around technical challenges regarding dome correction and perspective warping in virtual production, and camera tracking in dome-based virtual production. These are not discussed in this paper.

3 The project also employed two interns – Michaela Moclair and Thomas Fitzgibbon, a Camera Operator.

Plymouth's Artist Development Programme – Zoe Maramba – and one from Theatre Royal Plymouth's Engagement and Learning Programme – Clive Rowe as our 'future users'. The aim of the project was to write and 'alpha test' new software with a related set of facilitatory protocols for actor training. This is an 'end to end' approach of experimental testing typically used in software development which does not require 'end users' or analysis of end user experience. However, informed by the research context, we recruited participant actors without formal actor training, and specifically without prior experience of Meisner Technique. This was motivated by the futurological orientation of the project objectives – to test the design of actor training 'in the future' by working with actors unmarked by the normative approaches to Meisner Technique today. These actors were not familiar with Meisner exercises and games and not enculturated into the 'charismatic teacher' phenomenon that the project objectives were responding to. As such, these actors would not be re-learning a new format of Meisner Technique or experiencing a challenge to their habituations and expectations about training; they would be learning a new format for the first time, as an actor might in Pearlman and McLaughlin's imagined ideal future for Meisner actor training.

The project team collaborated with Real Ideas Organisation to access Devonport Market Hall dome – the largest size 360 immersive projection dome available in Europe – as a testing ground for the project. Building, testing and piloting 3D assets in this leading-edge facility enabled the project team to pursue the objectives in a future-ready technical space⁴.

The project delivered sprint-based workflows on technical challenges derived from the project objectives, each led by team-members with specific related expertise. The technical discoveries and achievements of these workflows were exploited via a non-linear integrated systems design approach, which co-embedded the technical, actor training and narrative design workflows in interdisciplinary 'scrums' as part of an iterative Agile⁵ approach.

To pursue these objectives, *Watercourse* drew on David Shirley's uncontentious understanding of the constituent exercises of the Meisner Technique: systematically, the Meisner Technique consists of a linear sequence of exercises that each iterate and elaborate elements of the preceding exercise. This begins with the 'repetition exercise' and progresses to the 'absorbing activity' (or, 'independent activity'), and then on to structured scenic improvisations, most famously involving 'the knock at the door' exercise. 'Text work' is introduced once students are deemed to have acquired necessary skills in these structured improvisatory exercises. This latter phase of Meisner Technique focuses quite practically on exploring performance options within a given text although, as Shirley writes, 'Meisner intended this technique to be used as a preparation for a scene – to get the actor going – rather than a means by which to determine how it should be played' (2010, 203). Meisner Technique is often used for rehearsal purposes but, informed by the context defined by Pearlman and McLaughlin, *Watercourse* was interested in Meisner Technique exercises as training drills for actors.

4 Pre-tests were conducted in Plymouth University's prize-winning theatre, The House, enabling the project team to maximise the testing time in the 360 dome and to identify new technical challenges for subsequent Agile sprints.

5 Agile methodology is a project management approach underpinned by cross-functional collaboration and systematic continuous improvement. Agile divides projects into smaller phases and facilitates teams through cycles of planning, execution, and evaluation involving multidisciplinary 'scrum' meetings.

To experiment with *mise en scene* and given circumstances-based elements of Meisner Technique the project team selected a narrative text to work with. Cautioned by Pearlman and McLaughlin's critique of Meisner Technique facilitation as overly concerned with "improvising a scene" (313) with narrative coherence, we collated texts that could provide the required elements of Meisner exercises – physical activities, given circumstances, *mise en scene*, objects – without prescribing specific dialogue, scenes or narratives. Selecting from novels and not screenplays or playtexts to minimise the sense of 'scenes' and reduce the presence and feeling of staged narrative structure for the participants.

Watercourse might be seen as premonitory or even pre-emptive of an automated future of actor training in which teachers are 'decentralised' to the point of non-existence. Although not testing or motivated by this potential future, in keeping with the futurological promise of the technological intervention in actor training we selected for texts that could activate aesthetically a sense of the *now* and of the near future. Accordingly, we thinned the pool to select from the literary genre of futurological fiction. To ground for the actors the futurological *mise en scene* in the present day and its discourses, we narrowed this search again to focus on stories of climate catastrophe.

When scouting locations in Plymouth as part of feasibility testing of photogrammetry for 3D modelling, we discovered this graffiti (Figure 3):

The graffiti, in Plymouth's Devonport area where the Market Hall dome is located, shows sea levels in 2030 according to climate modelling (coincidentally) undertaken by University of Plymouth's Coastal Processes Research Group. Having discovered this, we confirmed J G Ballard's *Drowned World*, as our source text: a novel set in the UK after global sea level rise and filled with multiple familiar UK locations depicted in the future, underwater and over-taken by the tropical flora and fauna that have accompanied temperature rises. *The Drowned World*, served as an aesthetic reference point for the 3D modelling, digital asset building and narrative design workflows of the project, providing the necessary elements of Meisner Technique exercises. We did not extract character or narrative for use in the actor training exercises.



Figure 3 Image: 2030 sea level height marked on a building in Plymouth's Devonport and Climate Central map of 2030 water levels in Plymouth.

Objective 3 workflows: utilising immersive tech and virtual production to construct and maintain an interstitial space-time in which sustained relational encounters could occur

Inspired by Pearlman and McLaughlin's reading of Freeman's *Time Binds* (2010), the team tested means of aestheticizing a physical workspace that would, by its aesthetics, sustain non or antinormative actions and possibilities without participants experiencing what Freeman calls the 'temporal drag' effect of Queer Time (2010, 93). Queer Time, according to Freeman, might be understood as manifest as turbulent experiences within space-time that disrupt the 'chrononormative'. These experiences highlight Queer subjectivity as asynchronous with time experienced through normative rituals and cycles.⁶

6 Freeman tends to use the term 'Queer time' to describe experiences that bring about disapprobation and repudiation for Queer subjectivities but Pearlman and McLaughlin 'reclaim' the term to define an idealised experience in which Queer subjectivities can experience time without 'drag', or personal harm.

This was a speculative premise about the effects of aesthetics in the immersive environment created: an immersive environment that figured mimetically the near future might be supportive of non or antinormative actions which might 'drag' in the present day. Following Michael Taussig's thesis in *Mimesis and Alterity*, such a mimetic aestheticized immersive environment might enable participants to sustain 'alternatives' without the intrusive or oppressive effects of chrononormativity. Taussig describes the 'mimetic faculty' as

'The nature that culture uses to create second nature, the faculty to copy, imitate, make models, explore difference, yield into and become Other. The wonder of mimesis lies in the copy drawing on the character and power of the original, to the point whereby the representation may even assume that character and power... this is "sympathetic magic", and I believe it is as necessary to the very process of knowing as it is to the construction and subsequent naturalization of identities' (1993, 70)

Aligning Taussig's theory with Pearlman and McLaughlin's thinking on Queer Time in actor training *Watercourse* set out to explore the hypothesis that an immersive environment that looked and felt different and possibly even resistant to the everyday might cultivate and support non-normative activity. In contrast to the normalising imperatives of conventional Meisner Technique space-time identified by Pearlman and McLaughlin, *Watercourse* set out to use technology to generate a felt sense of 'quasi-quotidian' space-time.

Utilising the text as an aesthetic source material a 3D model of Plymouth's Union Street was made using on-site photogrammetry – a digital photography technique for surveying, mapping and measuring distances between objectives and for capturing surface textures that can be overlaid onto a 3D model that can be piloted in a game engine (UnReal, in this case). The result was a high-fidelity photorealistic 3D model of Plymouth's iconic Union Street flooded to forecast 2030 sea levels. A model rich with photorealistic assets that could be real-time piloted, including those taken from site visits, such as vehicles, bus stops, wheelie bins and debris as well as those generated based on predictions

of a warmer future in Plymouth, including tropical flora and fauna, such as vines, canopy cover and large aquatic and sub-aquatic predators (Figure 4a,b).

Running the model in Unreal enabled real-time piloting of lighting, correcting textures and colours automatically to render changes in the angle and intensity of the sun that lights the model, rendering changes in time of day and year (Figure 5a,b).



Figure 4 (a and b) Image: 3D model of Union Street & 3D model running in Unreal game engine. Photo: Musaab Garghouthi.

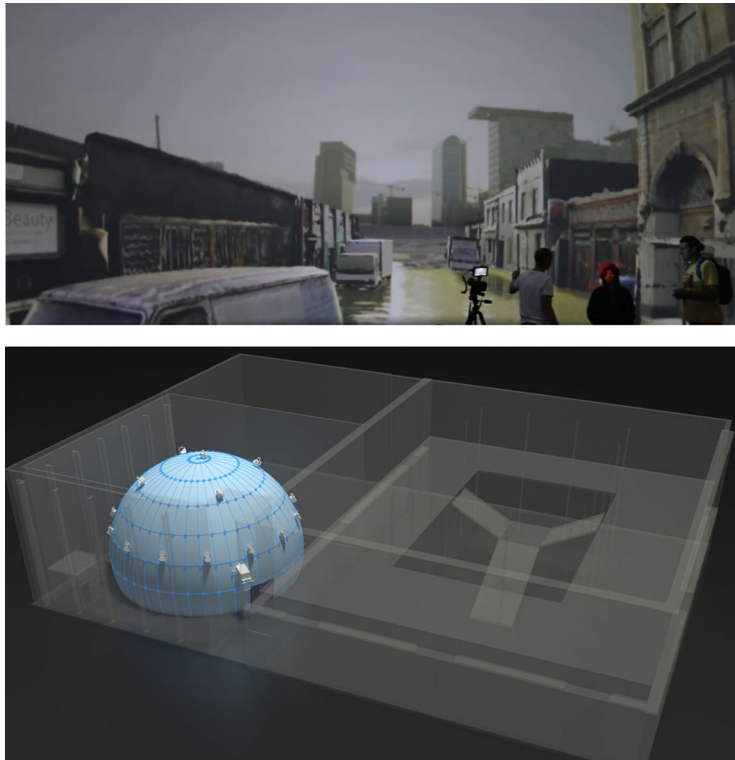


Figure 5 (a and b) Image: John Matthews, Zoe Maramba and Clive Rowe in Market Hall dome, immersed in a perspective-corrected 3D model of Plymouth's Union Street flooded to projected 2030 sea levels. Architectural schematic of Market Hall dome.

Objectives 2 & 3 cross-cutting workflows: language use with participants

Selecting participants unfamiliar with Meisner Technique introduced a challenge in the practical research and workflows on objectives 1 and 2: how to give participants sufficient information about unfamiliar exercises without straying into the 'charismatic teacher' trope that we were seeking to redress. Radical alternative means of explaining the 'rules' of Meisner Technique were explored, such as fully-automated pictographic and diagrammatic instruction delivered in the model but, for all the ethical problematics associated with teachers and their use of language identified by Pearlman and McLaughlin, *Watercourse* was not testing the potential of non-human teachers or of fully automated teaching. The ethical implications notwithstanding, training has been understood as a uniquely human activity (Matthews 2014, 155–164) and *Watercourse* objectives were designed to scope and test the capabilities of digital immersive and virtual production technologies within this category of human experience. Recognising a necessary level of language-based communication it was necessary to identify, employ and exploit language-use strategies, modes and practices for verbal instruction-giving that might have minimal or reduced normalising effects on participants. *Watercourse* drew on key findings made in the

AHRC-funded *Anatomy of Performance Training* project (2013–15) to codify and employ distinct language-modes for verbal instruction that would reduce the over-determining effect of the teacher in the participant's interpretation of the instructions they receive. Verbal briefings were given using 'sympathetic illustration'; a language mode for instruction-giving that can, 'undermin[e] the certitude of the instruction, and the trainer. Imagining a shared space of inability and unknowing, as opposed to imposing certainty ... [giving a] trainee confidence in his or her own ability to "figure it out for myself"' (2014, 96). This mode of instruction establishes a symmetrical 'sympathetic bond between trainee and "instructor"' based not on the instructor's competence or authority but on the instructor's own limitations, errors, misunderstandings and incompetence exemplified in their 'novice state of vulnerability, prior to [acquiring] expertise' (95). Sympathetic illustration is a "lesson" rather than a command' offering the student 'the benefit of ... experience, sharing knowledge with the student as opposed to simply imposing rules' (96). Instructions were pre-planned to include sympathetic illustrative language, were minimal and designed not to exemplify 'correct' practice or outcomes. Verbal briefings precluded the terms 'scene', 'character', 'narrative' or 'story' because the research context had observed the over-determining effect of these concepts in deriving normative outcomes and in prejudicing post-practice interpretations (Pearlman and McLaughlin 2020, 313–317).

Substituting unreal assets for language commands in the facilitation of the exercise

Using assets in UnReal in place of language-commands to facilitate exercises represented one means by which the project team could achieve objective 1, 2 and 3. Using assets to stimulate, respond to, motivate or guide actors in Meisner Technique exercises represented means by which to decentralise the authority of the teacher in the physical and psychosocial workspace of the exercise.

Pearlman and McLaughlin imply two related but distinct definitions of 'space' in their analysis: the literal, physical 'workspace' (319) of a studio or classroom and the psychosocial 'space' shared and occupied by participants and teachers, which is attendant on the physical space. This latter meaning-sense of 'space' is largely implicit in their critique of the embodied experience of participants in the exercise and in their assertion about the latent potential within the repetition exercise to, 'open a space' (312) in which to 'let go' (312) of ideological assumptions and everyday codes of thought and action.

Quite literally moving Meisner's desk out of the physical workspace of the exercise and locating this at an external command position, out of the field of vision of the participants, represented one means by which immersive and virtual production technology could be used to achieve objective 2. For a teacher to facilitate the exercise remotely required more than (literally and figuratively) moving their desk out of view. This required generating the 3D model to run as an immersive projection in the workspace as well as building digital assets that the teacher could pilot remotely from that desk, in ways that would stimulate and facilitate participants non-verbally.

The emphasis in Meisner Technique approaches is famously placed on ‘the other fellow’ (Meisner in Longwell, 1987, 34) – the exercise partner – rather than on observing and commenting on external or ‘environmental’ factors or changes. However, while the repeated verbal observations that are the hallmarks of Meisner Technique are invariably and specifically about observing and interpreting the fellow participant’s behaviour Meisner’s approach includes and uses objects, imaginary contexts (given circumstances) and physical *mise en scene* – most famously, a door – to provoke and contextualise behaviour.

In the context of Meisner Technique, objects and *mise en scene* are introduced in the ‘independent activities’ and in the ‘knock at the door’. Objects, locations and contexts form part of the fabric of Meisner Technique exercises and are used to facilitate participants: teachers will instruct participants to begin, repeat or restart tasks and activities with objects and to use *mise en scene* and given circumstances. Thus, digital assets were developed co-creatively with the participants and project team using the text as a reference. Participants and project team members generated a list of potential assets derived from the *mise en scene* of ‘drowned Plymouth’. From this list, the team took pragmatic decisions about which digital assets could be most effectively built within the project resources, diminishing the over-determining effect of singular authorial influence of the teacher in shaping the *mise en scene* and delimiting the potential thereof.

With assets built and piloted from a remote workstation, I ran Meisner Technique exercises with participants immersed in the real-time immersive model they had helped to create. The participants were able to sustain repetition-based improvisations that were facilitated by the appearance and operation of assets in the 3D model. A notable moment is depicted below wherein a digital asset – a flock of birds, just visible in the sky behind actor Clive Rowe in the images below – is triggered during the repetition exercise and this stimulates the participants to react, and to comment on these reactions in the repeated verbal exchange quintessential to the exercise. Prompted by the flock of birds digital asset, the actors’ improvisation took an un-pre-planned turn in which Zoe, demanding Clive’s bag, sought to physically climb up onto another digital asset – a bus stop – so as to get into a first floor window in the 3D model of a building on Union street in order to escape the flooding heralded by the disturbance of the birds from their roosts. The verisimilitude of the model and the motility of assets apparently supporting the improvisation of the exercise in potent ways (Figure 6).

Using HTC motion tracking to facilitate non-verbally: participants unintentionally triggering assets

To explore further the potential of using immersive and virtual production tech to decentralise the teacher in the facilitation exercises, we utilised motion tracking to trigger assets. Having moved the teacher out of the physical workspace this workflow was concerned with decentralising the teacher’s influence further. Informed by the critique of the normalising effect of single authoritative control in actor training this motion-tracking workflow was designed to deploy and drive assets non-intentionally. This



Figure 6 Sequential stills from footage of Zoe Maramba and Clive Rowe practising Meisner Technique in *Watercourse* experiments (improvisation described above).

involved mapping the physical workspace and fitting objects and participants with HTC vive trackers, creating digital markers in space and linking these to a queuing protocol for asset deployment. Now, when participants moved into certain regions of the dome space or handled objects within the space digital assets would be triggered and deployed.

The mapping of the objects and spaces and the protocols used was arbitrary and participants were not aware of these in advance. Over repeated iterations of the exercises, the participants might develop an awareness of the mapping and queuing protocols and so to inhibit intentional facilitation the team used algorithms that could be programmed to change and update maps and queue allocations between iterations. Although only working with a limited number of assets and a comparatively elemental space mapping/queue allocation, this workflow demonstrated the potential of mapping and tracking to trigger and drive complicated assets and support non-intentional facilitation of a structured improvisation actor training exercise (Figure 7).

High-fidelity dome-corrected VP playback as a means of reflecting on ‘impulses’ produced in the space-time

Using virtual production techniques to generate high fidelity playback footage enabled the self-reflective and discursive activities that book-end Meisner Technique exercises to be remodelled in ways that promoted



Figure 7 Images show HTC vive tracking experiments in House theatre and Devonport Market Hall Dome.

non or anti-normative outcomes and interpretations and intimated the potential to Queer Time actor training.

Post-practice reflection is commonplace in exercise and game-based training, with participants acquiring knowledge through self-reflection and *via* the commentary of teachers and peers. In Meisner Technique, such reflection is predicated on individual memory and therefore highly attuned to personal feelings and enculturated interpretations. In the absence of objective evidence of events unfolding during an exercise, the teacher and participants remain in an asymmetrical relation with regards to their relative authority in interpreting the event. Considering Pearlman and McLaughlin's critique, this post-practice reflection is inherently bias towards the teacher's interpretation of the event of practice irrespective of the teacher's motives or ethics because of the asymmetrical power relationship between teachers and students, and this may have an over-bearing influence on training outcomes for participants. This over-bearing influence is not ethically *bad* but ethically fraught. It is neutral *visa vi* intended outcomes of training, of course, and it is reasonable to assert that teachers *should* be able to bring about intentional outcomes *via* this commentary. Indeed, in one sense, that would be the explicit purpose of teaching.

We might understand this analogue approach to post-practice interpretation as both a pivotal phase in actor training and as one beset by the thorniest of dichotomies in theatre practice – audience/actor⁷. In place of this 'analogue' approach in which participants and teachers compare their recollections of the exercise in the context of a seer/doer, interpreter/interpreted dynamic and vie for dominance in producing the abiding interpretation of the meaning of past events, *Watercourse* utilised virtual production to experiment with alternatives that would belie the authority of any one individual in producing that interpretation. Filming practice or gathering other data and meta-data points during training and reflecting on that documentary data has been commonplace in training practice for decades, especially so in elite sport. However, by using camera tracking in the training workspace and by writing code to perspective-correct the 3D model projection in real time *Watercourse* was able

⁷ For exegesis of this dichotomy in theatre and performance discourses see *The Life of Training* ([2019] 2021, 17 – 19)

to demonstrate the potential to produce documentary footage that captured the immersive world in which actors were training as opposed to an 'outside' viewpoint on this. The resulting film footage has a highly photorealistic and 'post-production' quality, meaning that the object that provides the basis of reflection is detailed and data-rich, and crucially with regards the object to *Queer Time*, not seen from the teacher's perspective or the participants perspective as such, but rather from distinct viewpoints 'within' the space-time of the exercise.

In *Watercourse*, we utilised two mobile position-tracked cameras. In an immersive space such as the Market Hall dome, a camera can be positioned anywhere and can move between any fixed points, and there is the potential for multiple camera positions. This gives the possibility to produce multiple synchronous perspectives on an unfolding exercise and to view these sequentially and simultaneous as part of a digital-evidence-informed post-practice reflection.

As a resource for post-practice reflection this gives the scope for innumerable subjective viewpoints on events that can be compared and none of which attains a supremacy over the others tout court. As a supplementary resource and tool for collective reflection, this is exceedingly rich and helps to make relative and comparable the perspectives of participants and teachers and to undercut the tendency towards singular authorial interpretation of meaning. Documentary style footage does not, of course, represent truth or even necessarily truer viewpoints on events. However, in context of post-practice hermeneutics it might provide additional points of reference, pluralising interpretations or supporting interpretations not already underpinned by hierarchical authority (Figure 8).

Actor training underwater in the future: findings against objectives

The achievements against the various workflows aligned to the project research objectives indicate scope for future practice and teaching of Meisner Technique and other actor training exercises using digital immersive and virtual production technology. Although the project utilised multiple technical elements and systems in the workflows, especially for objective 3, which would be challenging for others to replicate without the full dome capability of *Watercourse*, the findings against each objective indicate the possibility of implementing project findings and methods selectively for further testing, research and theorisation.



Figure 8 Images shows dome corrected VP playback [left] and participants and project team viewing playback footage together in the physical workspace of the Market Hall dome [right].

1. To use immersive technology and virtual production techniques to decentralise the conspicuous authority of a teacher in facilitating the exercise.

Objective I was not intended to reduce the authority of a teacher or trainer but to make this authority less *conspicuous* and thereby reduce the delimiting and potentially oppressive effect of the teacher on participant choice during practice. Using a remote workstation to pilot assets as well as mapping and marking the workspace with HTC vive tracking and using non-intentional spatial and auditory triggering for assets in UnReal that would facilitate participants quite literally decentralised the physical presence of the teacher in the workspace.

Informed by risk assessment, the decision was taken to gradually ‘shut down’ the digital elements of the workspace when halting exercises to avoid sensory disorientation and injury. This proved an effective choice with regards to objective I: in place of the orthodox approach of a teacher making a verbal and/or physical interjection to halt an exercise, bringing an abrupt and summary end to participants’ seeming autonomy within practice, gradually dismantling the digital elements of the workspace signified the contingency and complexity of the psychosocial space that had been created during improvisation, and the mimetic labour that had gone into making and sustaining it. Following Taussig’s thinking, this ‘showing of the workings’ was an explicit reminder of the mimetic labour of construction that goes into the naturalization of identity and also its contingent nature.

Using motion tracking to trigger assets reduced intentional influence per se and not only the conspicuous authority of the teacher. The facilitation of Meisner Technique in *Watercourse* diminished the conspicuousness of the teacher as an authority figure in exercise facilitation and distributed the authority for facilitation more broadly. This non-intentional facilitation interrupted the potential for any individual – participant or teacher – to ‘direct scenes’ during training exercises and thereby acted as a partial inhibitor of narrative tropes. (Many may consider this an undesirable outcome for Meisner Technique as a rehearsal or even training technique.)

Achievements in workflows on objective I also indicated the potential of dome-corrected and perspective-corrected motion-tracked virtual production using UnReal to provide multi-perspectival documentation on training that can be used in post-practice reflection. Using multi-perspectival dome-corrected VP playback pluralised the otherwise singular authorial power of the teacher over narrative interpretations of events and experiences occurring within the exercise. The ability for participants and teachers to re-watch together live action playback from multiple perspective-corrected viewpoints enables teachers to facilitate data-rich interpretation and reflection on practice. The data-richness of multiple POVs supports individual recollection of experiences and alternative external viewpoints on these experiences, and interpretations of them. The in-production compositing of virtual production means no time delay between the experiences felt within practice and the data-rich reflective discussions and interpretations of these experiences post-practice. Being able to composite in-production and to utilise the capacity of the workspace for playback and visualisation offers the potential for instantaneous

and data-informed post-practice reflections that can support multiple interpretations and, perhaps crucially, render different interpretative viewpoints relative to one another without ascribing a hierarchy to these.

2. To use immersive technology and virtual production techniques to decentralise language-commands in facilitating exercises

Objective 2 was not intended to make Meisner technique non-verbal but to decentralise language-commands in facilitation. Digital assets were utilised to facilitate participants by augmenting the *mise en scene* and environmental stimuli. Building 3D models and assets and using these to facilitate participants' improvisations reduced the frequency of language-commands required to facilitate the exercise.

Watercourse experiments were able to limit verbal instruction and yet still retain the capability for a teacher to intervene *during* practice without the normalising foreclosure effect of language-based instruction described by Pearlman and McLaughlin.

3. To utilise immersive technology and virtual production to construct and maintain an interstitial space-time in which sustained relational encounters could occur.

The workflows aligned to this objective were speculative and highly experimental and developed from Taussig's theory, and the proposition that the aesthetic of the space-time in which exercises are practised might be influential in supporting non and anti-normative acting choices and participant subjectivities. *Watercourse* exploited immersive dome projection's capacity to produce feelings of both the 'authentic' and the 'synthetic' nature of the every-day in constructing an internal felt experience. David Shearing has noted that 'immersion is not... an external experience given to someone. It is an internal state, built through an individual's sustained relational encounters with the world' (291). The interactive tracking and mapping of the space provided the conditions in which participants could cultivate this internal state and the dismantling of assets to conclude exercise practise reinforced the synthetic and contingent nature of the physical workspace and the associated psychosocial space for participants.

Now, the newness of virtual production and dome immersion motion tracking technology lends a sense of the non-quotidian and the futuristic for most participants. Whether or not actor training experiences can continue to be sited on the continuum between verisimilitude and the uncanny as this technology becomes more ubiquitous and familiar to 'users' is moot. Indeed, the diagrammatic capabilities of immersive technology may ultimately be more efficacious in building and sustaining 'internal' experience in the future; a proposition it is difficult to test today, when most encounters with this technology emphasise the compelling novelty of its photorealistic effects.

The specific Plymouth-based near-future climate catastrophe context of the *mise en scene* selected was intended to be influential in producing and exploiting the 'mimetic faculty'. Whether these affects can be produced with *any* *mise en scene* is doubtful, although the practice of co-creating models and assets with participants by using on-site photogrammetry

techniques might represent a methodology for a particular kind of participant engagement in actor training. The co-creating with participants of the photogrammetric 3D model in a real-world location could be an important aspect of the generation and sustaining of a permissive space-time in which to practice exercises.

When on-location photogrammetry is used to generate 3D models, instead of, for example, automated LiDAR scanning, the resultant 3D model may have a particular real-world experience-based reference point for participants which may be influential in their actions and responses during training exercises that subsequently use these models.

Watercourse used virtual production and immersive dome projection technology to decentralise language commands and the conspicuousness of teacher authority in the facilitation of Meisner Technique training exercises. More work is required now to assess the efficacy of these achievements in Queering time for participants: beta-testing to give qualitative evaluation of participant experiences in training as well as a rigorous methodology for comparison with participant experiences in ‘analogue’ training approaches. The experimental testing of *Watercourse* and the findings made against the project’s research objectives are open to speculative theorisation, which could be productive in designing new research imperatives and objectives for projects examining virtual production and immersive tech in actor training in the future (under water).

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