The situated agency of studio learning and its value for non-studio disciplines

Andrew John Warwick Middleton

A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
for the degree of Doctor of Philosophy

December 2021

Candidate Declaration

I hereby declare that:

1. I have not been enrolled for another award of the University, or other academic or professional organisation, whilst undertaking my research degree.

2. None of the material contained in the thesis has been used in any other submission for an academic award.

3. I am aware of and understand the University's policy on plagiarism and certify that this thesis is my own work. The use of all published or other sources of material consulted have been properly and fully acknowledged.

4. The work undertaken towards the thesis has been conducted in accordance with the SHU Principles of Integrity in Research and the SHU Research Ethics Policy.

The word count of the thesis is 11,796.

Name	Andrew Middleton
Date	04 December 2021
Award	PhD
Faculty	Culture and Creativity Research Institute, Social Sciences & Arts
Director(s) of Studies	Dr Becky Shaw

Abstract

This thesis appraises journal articles and book chapters published between 2009 and 2018. The earlier research considers how a range of audio methods can be adapted to the needs of teaching in higher education. At the time, audio brought a new layer of presence and connectivity to the learning space (2009). Further work, using a scenario-based futures analysis method (Ramire *et al*., 2015), challenged a trend in the literature suggesting the value of educational podcasting was as a medium for conveying the lecturer's voice (2011). Instead, my research argues that mobile audio-based learning can be facilitative, active and integrated, able to incorporate diverse voices and foster disruptive pedagogies. Reconsidered in 2016, audio is discussed as a disruptive extension to binary conceptions of formal-informal, physical-virtual learning space. A series of chapters (2018) incorporating diverse accounts of academic practice, student experience, and professional services roles, explore the changing nature of higher education learning space. Here, the context is expanded to accommodate diverse forms of digital and social media. The studies examine experiences situated within, across and beyond bounded learning spaces to explore: how they disrupt traditional dependencies on enclosed spaces and models of formal delivery; the emergence of learning networks as disruptive influences that challenge traditional dependencies on learning hierarchies; the disruptive use of personal smart technologies and social media in comparison to institutionally provided learning space and services; and, models of rich, experiential and active learning offering viable and engaging alternatives to content-centred models of teaching.

An analysis of the publications demonstrates an emerging digital-social age hybrid studio learning paradigm capable of promoting learning agency as an outcome of co-operative and generative learning. The implications and transferability of this studio learning paradigm for higher education beyond studio disciplines, are discussed in a final paper (2017).

(294 words)

Glossary

This glossary provides initial definitions for conceptual terms used within the thesis. Many of the entries are considered in more depth within the text.

Actant	Anything that makes things happen, whether living or inanimate. (Latour, 2005)
Actor Network Theory (ANT)	A theoretical mapping that explains the effect of a broad network of people, objects, and ideas. (Latour, 2005)
Affordance	The actions made possible by an object or environment. (Gibson, 1979/1986)
Agency	The capacity of an individual to act within a social structure. (Giddens, 1984)
Assemblage theory	An appreciation of human and non-human factors and their capacity to effect change independently and collectively as an ecosystem. (Delanda, 2016)
Authentic learning	Learning characterised by real-world problems, open-ended enquiry, socially-situated learning, and self-directed learners. (Rule, 2006)
Cognitive apprenticeship	A theory in which the value of tacit knowledge and skills are explicitly valued, observable, replicable and practiced with support. (Brown *et al.*, 1989)
Constellation	An ecology of dynamic entities which together reveal new meaning. (Delanda, 2016)
Didacticism	A teacher-centred instructional approach to education (Barr & Tagg, 1995)
Dialectical thinking	To view issues from multiple perspectives and towards an economical and reasonable reconciliation of seemingly contradictory information and postures. (Manzo *et al.*, 1992)
Digital	Spatially, a broad term that reflects the significance of digital technology on processes and experience.
Distributed cognition	Collaborative acts involving individuals, artefacts and

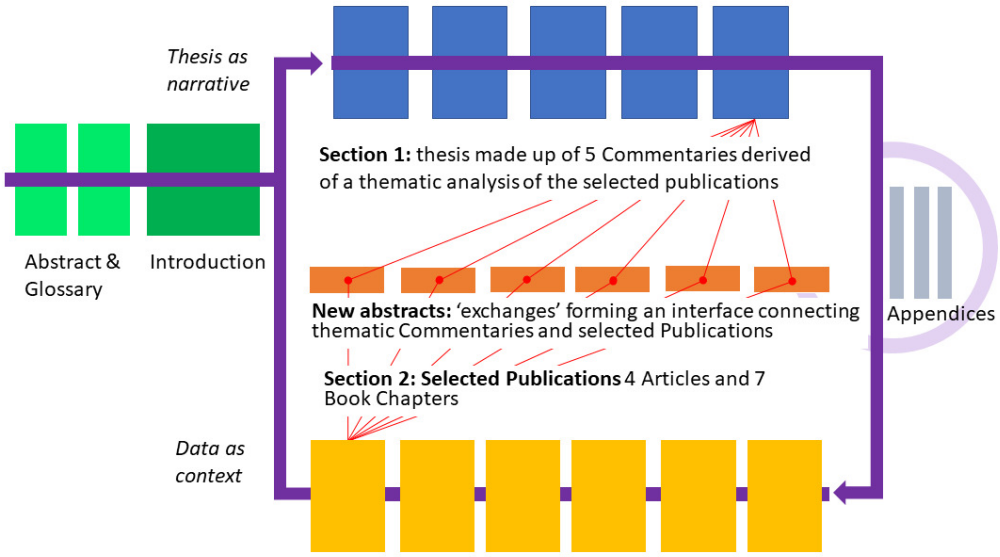
	internal or external representations as one cognitive system. (Gieri & Moffat, 2003; Hutchins, 1995)
Ecology	A linkage between people, their ways of thinking, being and doing, to their environment, whether actual or imagined. “A learning ecology is a place where learning and the environment are indivisible.” (Barnett & Jackson, 2020, p. 2)
Ecosystem	A multidimensional dynamic system affecting life.
Experience and experiential learning	Experience, and experiential learning, “offers a contestable and ambiguous terrain where different socio-economic and cultural assumptions and strategies can be differentially articulated.” (Usher 2009, p.170) In this thesis, experience is a broad ontological idea in which the student’s engagement with formal and non-formal learning contexts is understood as their site of agency. Kolb’s (1984) model of experiential learning refers to the systematic reflection in and on active engagement in challenges.
Hybrid system	A system comprising of two or more paradigms working together seamlessly to deliver desirable outcomes.
Interstitial	Interstitial space describes the interface, adjacency, touching or meeting points between two or more spaces. (Savin-Baden & Falconer, 2016)
Inviting affordances	Spatial qualities that solicit actions and which invite the agent to feel drawn to act in a certain way. (Withagen *et al.*, 2017)
Learner	A person engaged in learning, either intentionally or unintentionally.
Learner-generated context	A situation consciously constructed by its participants with the aim of co-creating knowledge as an act of learning. (Luckin *et al.*, 2011)

Legitimate peripheral participation	Learning understood as a situated and scaffolded activity in which a person's intentions to learn are engaged through a process of becoming a full participant in a social cultural practice. (Lavé & Wenger, 1991)
Liminal	A significant crossing of a boundary, a rite of passage, or the passing through from one situation to another, anthropologically and educationally. (Turner, 1974)
Material	Spatially, the physical, tactile or actual world as opposed to 'virtual', 'digital' or cognitive space.
Network	A non-hierarchical and often dynamic conception of social or technical connectivity or relationships.
Networked learning	Networked learning encompasses "an understanding of learning as a social, relational phenomenon, and a view of knowledge and identity as constructed through interaction and dialogue." (Ryberg *et al.*, 2012, p. 46)
Ontology	The science or study of being and the associated beliefs and values that inform individual and collective perceptions of reality.
Paradigm shift	A fundamental change in the basic concepts and practices of a discipline as a reaction to the discovery of anomalies, which disrupt hitherto accepted positions that lead to disruption. This theoretical position contrasts with ideas about change as an evolutionary 'development-by-accumulation' process. (Kuhn, 1962)
Pedagogy	Teaching and learning philosophy, design or method.
Pervasive learning	The effect of ubiquitous access to technology on learning. (Kukulska-Hulme, 2010)
Place	'Lived' space imbued with meaning for one or more people (Lefebvre, 1974/1991) or sociomaterial space

	in which space and social practice coexist. (Orlikowski & Scott, 2008)
Polycontextual	Experiencing more than one context simultaneously. (Bates & Bowman, 2015)
Post-digital age	Epitomised by the seamless cohabitation of analogue and digital media. (Sinclair & Hayes, 2019)
Praxis	Actions that result from the deliberate application of theory in practice and which lead to critical reflection. (de Laat & Lally, 2003)
Presence	The extent that personal connection with others is felt, i.e. through being noticed; sharing; interaction; identity. (Sung & Mayer, 2012)
Rich media	Time-based media including audio, video and interactive media that capture or convey experience or which immerse the user in experience.
Rhizomatic learning	A Connectivist term (Cormier, 2008) which uses the botanical metaphor of the rhizomatic plant which has no centre or defined boundary, constructed of multiple semi-independent nodes, each capable of sustaining its own life, as determined by the limitations of its habitat.
Signature pedagogy	The specific types of teaching and learning strategies used by disciplines and which reflect how future practitioners are educated for their new professions. (Shulman, 2005).
Smart devices	Ubiquitous multifunctional and connected personal mobile computing such as phones, tablets, laptops, and watches.
Space	Space is a problematic term with a multiplicity of meanings from a material conceived construction to ideas of perceived space or experienced or lived space. The latter usage emphasises space as *place:* the “enacted, turbulent, entangled and hybrid.”

	(Fenwick *et al.*, 2011, p. 129)
Studio	I define studio as ecologies of situated learner agency in flux. Studio is often used to describe: i) a built environment usually associated with creative practices; ii) a pedagogic philosophy; iii) a pedagogic approach; iv) professional settings and practices used in the creative industries.
VLE	An institutionally provided online learning management system or an assemblage of compatible online tools intended to work together.
Voice	Depending on context, I use voice to mean either having a sense of agency or, more literally, the spoken word.

Schematic to aid navigation of the dissertation



A PhD by publication is inherently problematic because it must present the thesis (the theoretical framework, its analysis and conclusions) and the selected publications which inform the analysis. Consequently, there is not a straightforward way to write or read the work. The above schematic suggests two options for navigating the study:

1. Using the 5 Commentaries that make up Section 1 (the thesis) as a narrative route, followed by the publications in Section 2
2. Reading Section 2 (the selected publications) first to establish the contextual matter before engaging with the thesis and its presentation of the thematic analysis and conclusions.

Option 1 (as ordered in the table of contents) sets out the ideal model of the Hybrid Learning Studio supported by the thematic analysis through a series of framing hypotheses. Some specific signposting to the publications and their case studies or findings is made through the analysis. Option 2 requires the reader to engage with the publications without detailed knowledge of the overarching theoretical framing and thematic analysis. However, the addition of a new abstract for each publication to introduce it within the context of the PhD study makes this option viable. The new abstracts also serve as an 'exchange' designed to make explicit connections between the thesis and its commentaries to the accounts presented in each publication.

Whichever route is taken, the Introduction explains the study's aims and theoretical framework.

Section 1: Thesis

Introduction - dilemmas of innovation and disruption

My research investigates the affordances of technology, digital media, and space and is situated within my higher education role as a leader of academic and curriculum innovation.

The massive growth in higher education (NCIHE, 1997), and the societal adoption of digital technologies during this time define my context. Education has existed within an unending frisson of societal change, challenge and opportunity; however, educational practice has struggled to adapt (UK Government, 2019) and could be considered to be broken (Barber *et al.*, 2013). My experience reflects Barnett's observation that there is generally insufficient imagination, depth and criticality for reconceiving university education (2013).

Despite this, as my research reveals, academic teachers want their students to thrive by engaging with rich learning experiences. This incongruity led me to consider voice as a locus of pedagogic development and, specifically, to consider audio as a medium for sustaining the ephemeral qualities that enrich the interpersonal exchanges valued by academics and students alike. I have hypothesised that digital audio, as an emergent and accessible medium, can disrupt the teaching and learning nexus and establish new appreciations of university education as a space to experience and co-create knowledge.

My praxis has iteratively interrogated the tensions surrounding a student's learning experience and the forces that can confound and alienate them (Evans *et al.*, 2015; Mann, 2001). Personalisation of the learning experience and the development of a co-operative learning environment are persistent themes in my publications and have led me to consider 'studio' as an ideal, challenging the persistent dominance of didactic and techno-centric forms of education (Barr & Tagg, 1995). Instead, I examine learning from an ontological and learning-centred perspective reflecting ideas of learning ecology (Barnett & Jackson, 2020), ambiguity (Austerlitz *et al.*, 2008), and uncertainty (Barnett, 2000). Learning is an outcome of a person's associations, agency, and experience; technologies and material space must be subservient to this. I look beyond operational pragmatism and the superficial novelty of emergent knowledge, ideas and technologies, therefore.

There are different degrees of receptivity to new ideas in an adopter population: proactive and receptive innovators are rare (Rogers, 1962/2003). Most people resist change due to competing priorities, needing more evidence, not believing themselves to be changemakers, or not being committed to organisational goals. Further, teaching is notoriously intransigent and bounded by its identities and traditions (Becher & Trowler, 2001; Shulman, 2005).

Educational receptivity to change reflects the innovator's dilemma (Christensen, 1997) in which the practitioner ignores emergent threats and instead relies upon apparently logical proven strategies which ultimately culminate in failure. Scott-Webber (2014, p. 155), considering learning space design, echoes this impasse: "It's easier to do what we know how to do and have been taught how to do than to change, even though we know the change is probably for the better." Hasanefendic *et al.* (2017) observe that any cultural change in higher education is inevitably situated within an inability to align interest, experience, authority, and institutionalised practices. Any hypothetical model, therefore, including that of the hybrid learning space discussed in this thesis, must be cognisant of this intransigent force. Ideas about disruptive change and 'studio' in this thesis are presented as ideals enacted by innovators and situated on the edge of practice.

The selected journal articles and book chapters discussed in this thesis are forays involving teachers, students and educational developers. Initial work [A1, A2], explores how the ephemerality of voice can be harnessed by producing digital audio learning objects to bring new layers of presence and connectivity to the learning space, and how personal mobile devices can facilitate profound learning experiences through the incorporation of diverse learning and teaching voices within the learning environment. These approaches accentuate the value of learning agency and situation. In this way, I demonstrated how audio-enhanced learning disrupts the superficial, pragmatic, and impersonal pedagogies often associated with technocentric rationales.

In 2016 I decided to revisit audio as a disruptive force, challenging simplistic binary conceptions of formal-informal, physical-virtual learning space. The

richness and versatility of the medium emphasised its ontological properties as a connected place of learning, belonging and becoming. [A3]

In the chapters selected for this thesis from *Reimagining Spaces for Learning in Higher Education* (Middleton, 2018), I considered the disruption of dualistic thinking by considering learning space through an analysis of diverse case studies. [C1-C7] The chapters present accounts of innovative academic practice, student experience, and educational development. They present an ideal higher education as a site of unbounded and liminal experience in which a learner's agency is situated in a socially networked and co-operative paradigm: a hybrid learning studio.

This work led me to consider 'studio for all'; a closer examination of the hybrid learning studio that makes connections to the traditions and values of studio-based learning and their transferability to other fields [A4].

A hybrid learning studio for all

As Orr and Shreeve (2018, p. 326) note, 'studio' "offers a lens to look at educational practises beyond art and design." They observe a creative turn in higher education which challenges the hegemony of the written text and makes room for the adoption of creative teaching approaches across the disciplines.

I discuss 'studio for all' in the form of the hybrid learning studio as an overarching proposition. Studio, in this thesis, represents an intersectionality of meanings including material, social, cultural, professional, psychological, and pedagogical space. Indeed, the interplay *between* these meanings reveals much of the spatial and pedagogic value of studio learning for both studio and non-studio-based disciplines: the academic innovators in my case studies demonstrate how they make connections *across* conceptual boundaries leading to an unbounded idea, defining studio as ecologies of situated learner agency in flux.

The hybrid learning studio reflects my own experience of studio-based learning. All learning is, I posit, suited to the rigour, challenge, creativity, co-production, and the personal-social dynamic of the studio (Orr & Shreeve, 2018). It is not that studio is a panacea: it can be a place of social and cognitive dissonance (Burwell, 2016); however, studio, whether understood as material

space, pedagogic method, or philosophy (Shaffer, 2007; Brandt *et al.*, 2013), offers an ideal representation of the learner-generated context (Luckin *et al.*, 2011); a space in which to enact cognitive apprenticeship (Dennen & Burner, 2007) and embody situated learning (Lavé & Wenger, 1991).

This psycho-socio-cultural-material conception of studio is embraced in the model of hybrid learning studio present in my publications, even where the respective disciplines have non-studio traditions. The science lab [C6, C7, A4], the geographer's field-based studies [C3], the engineer's tutorial space [A1], the podcast assignment in Sport [A1], and student-led revision groups in medicine [C2], for example, all exhibit forms of situated learning that are predominantly agentic and co-operative.

In an age where graduate dispositions have more lasting value than epistemological knowledge (Tomlinson, 2017; Barnett, 2009), cultural homogeneity and disciplinary intractability seem out of place (Trowler, 2014). Connected and complex learning situations must reflect the complexities of the world (de Greef *et al.*, 2017). Personal agency, co-operation, connectivity, and boundary-crossing indicate how a richer educational studio ecosystem can be formed to accommodate learning that deals with complex problems relevant to today.

Approach

I embrace, explore, and find connections across multiple meanings of 'studio' using the hypothetical framework of the hybrid learning studio through the commentaries that follow based upon a content analysis of the selected publications. Each commentary develops the idea of hybrid learning studio as a viable space for student-centred active learning in the post-digital age in which the analogue and digital coexist (Fawns, 2019; Mathews, 2019; Sinclair & Hayes, 2019).

Situating my scholarship

I have selected from publications where I am sole author. As such, they represent my praxis: the need to evaluate my practice through the deliberate application of theory (de Laat & Lally, 2003, p. 32).

I have used action research in which “cases and decisions... open up new possibilities, even as they resolve problems”; a never-ending “moving back and forth between specific events and the general ideas and common traditions that might illuminate them, in order to interpret and engage the particular situation more fruitfully.” (Sullivan & Roisin, 2008, pp. xvi-xvii) My praxis uses a ‘practical reasoning’ methodology involving the application of principle-based frameworks which lend my work descriptive and conceptual, rhetorical and speculative, inferential, and applicatory powers (Halverson, 2002).

The selected publications are articles [A1-4] and book chapters [C1-7] reproduced in Section 2. I present each publication with a new abstract which connects the themes of this thesis to those original studies. Appendices 1 & 2 provide further information about the chapters and case studies in my book *Reimagining Spaces for Learning in Higher Education* (Middleton, 2018).

I conducted a content analysis of the selected publications and mapped them to the thesis using markup codes [A1-4, C1-7] (Appendix 3) which I have incorporated to support key points, although the themes underpinning the hypothesis are evident throughout my publications.

Hypothesis and contribution to knowledge

Collectively, my publications form an assemblage which reveals new meaning (Delanda, 2016; Smirnov *et al.*, 2017; St. Pierre, 2011) supporting the concept of the hybrid learning studio.

The hypothesis proposes that the hybrid learning studio offers a disruptive model of student-centred learning space valuable for developing agentic learners in non-studio disciplines.

The hybrid learning studio is a conceptual model; a multifaceted and multi-layered hybrid ecosystem (*fig. 1*) designed to develop the learner’s identity and agency as an outcome of navigating and negotiating knowledge and experience.

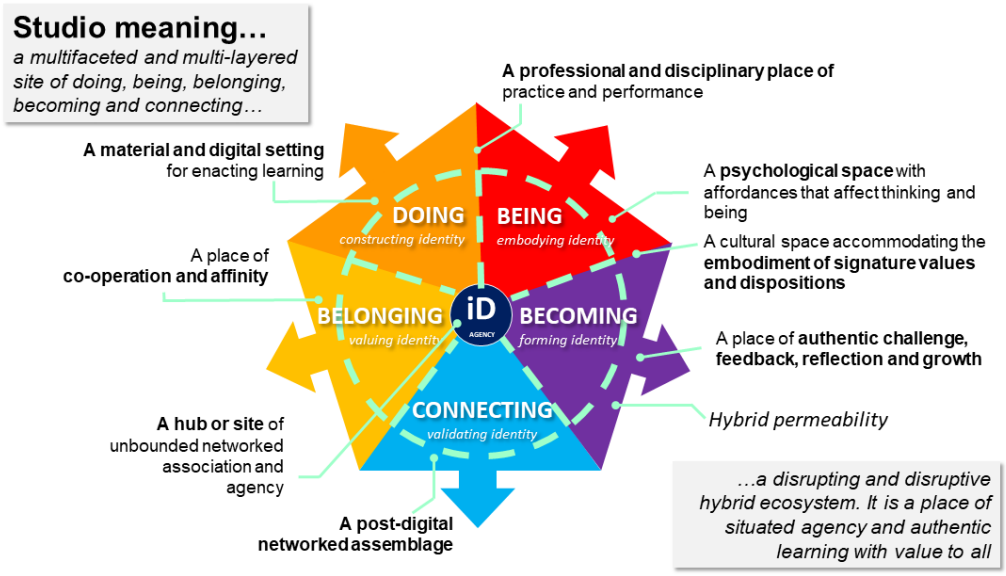


fig. 1 The Hybrid Learning Studio model: a place of doing, being, belonging, becoming and connecting

Commentary 5 concludes this exploration by proposing the value of co-operative studio-based pedagogy as an agentic site of learning for all.

Commentary 1: Disrupting traditional bounded spaces

[Key publications: C1-7 and A4]

In this commentary I explore the hypothesis that,

> *experiences situated within, across and beyond bounded learning spaces disrupt traditional dependencies on enclosed spaces and models of formal delivery.*

Bounded, enclosed and managed learning space

My research consistently returns to the metaphor of enclosure and perceived bounds as determinants of teaching and learning. I have observed a tension between the need to organise the delivery of teaching and the development of 'excellent' learning experiences. This led me to research space and its relationship to learning.

The need for universities to manage course delivery processes can obfuscate critical and creative thinking about learning and space. Consequently, a nuanced ontological discourse positioning learning as experiential and ecological can be subjugated to a binarity of reductionist thinking. Binary conceptions of learning and space and their multifarious places of intersectional learning are illustrated in *fig. 2* (Middleton, 2018). Lefebvre (1974/1991) discusses the significant implications of disconnected and incompatible thinking in spatial studies when discourses on conceived space, and constructed and managed space, come to dominate discourses on space as it is experienced. Rather than the conceptual ideas of space presented by architects and planners, Tuan (1977), amongst many, argues that 'place' provides the basis for considering the inchoate complexities of human experience, including how people learn.

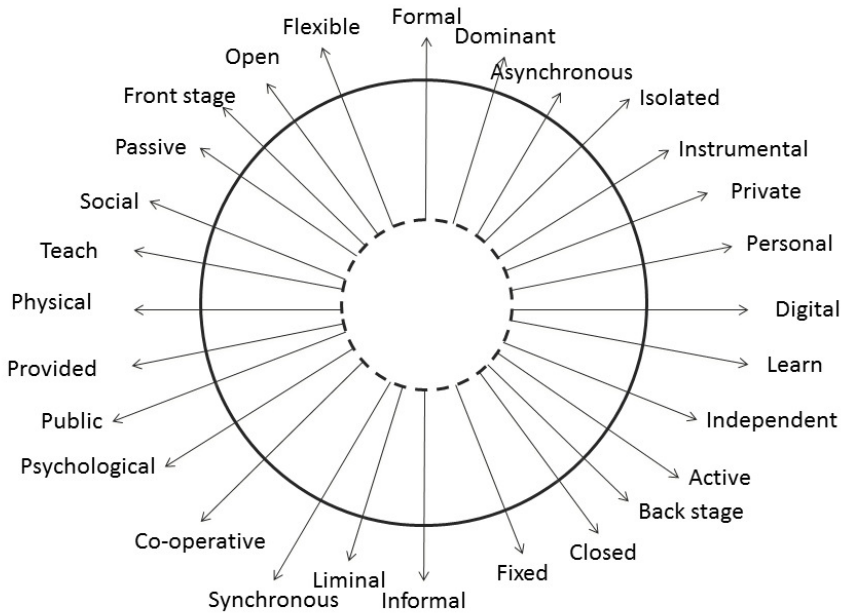


fig. 2 Binary conceptions of learning space

Learning's experiential richness can be represented as an assemblage (Delanda, 2016) of co-existing nuanced realities; an ecosystem of personal, dynamic and intersecting continua in which the spatial coincidence and connectivity of the learning environment become clearer. The coexistence of the physical and the digital, or the adjacency of the formal and informal, for example, emerge as being significant, reflecting ideas about being, transition, encounter, and enactment. The value of a learner's agency in crossing spatial boundaries also becomes apparent. Boundaries are not "physical, symbolic or imaginary lines but lived conditions where the 'inside/outside' are constantly negotiated, emergent and blurred." (Daskalaki *et al.*, 2012, p. 26)

Learning space, therefore, is less about managing facilities, methods or tools and is more usefully represented as a hybrid ecosystem; a multifaceted and multi-layered studio model (see *fig. 1*) designed to develop the learner's identity and agency as an outcome of navigating and negotiating knowledge and experience.

Voice in the audio-enhanced learning space

My research into the audio-enhanced learning space finds that the affective and psychological qualities of the spoken word have great learning value. [A1–A3]

Voice conveys nuance, ambiguity and presence. It affords an ontological richness that situates the agentic learner. Podcasting, for example, involves the serial delivery of media creating a sense of spatial and temporal 'home' to which the listener can subscribe; a space of intersection for the learner-as-listener and learner-as-producer. Ideas about home and placemaking recur throughout my studies of smart devices for learning (Middleton, 2015) and social media for learning [C2], informing the concept of hybrid learning studio.

Boundary-crossing

Hybridity is about intersection, liminality and dynamism. Ultimately, it is concerned with the development of self-actualisation (Usher, 2009) and learner agency (Bandura, 2006). The proposition of the hybrid learning space is that learning is experienced holistically, fluidly and without bounds. The learner traverses a connected space, echoing Daskalaki *et al.*'s (2012) ideas of negotiating displacement and emplacement. In-between spaces, hub spaces and adjacent spaces (Middleton, 2018), and third place (Oldenburg, 1989) emerge as significant lenses. While the affording properties and integral functionality of different spatial types are utilised by the learner, individually or collectively, the learner's conception of lived space accentuates the value of their liminal, even ritual, experience of movement between and across spaces. Thus, navigation and negotiation in the hybrid learning studio are notable as significant, if understated, acts of learning.

Smart personal devices accompany the learner wherever they learn in the post-digital age offering computing functionality supporting their fluent use of rich digital and social media [C3-C4]. Behaviours associated with these technologies and media pervade and extend the learner's reach and influence, disrupting pre-digital demarcations to provide access to social networks, boundary spaces, and peripheralities [C2]. Smart technologies, therefore, disrupt conceptions of learning space as being enclosed and the learner as being a necessarily inactive recipient. Analogue and digital media coexist creating a *metaxis* in which the learner experiences a "state of belonging completely and simultaneously to two different autonomous worlds" creating an ecological suspension between polarities or binaries (Falconer, 2011). In the

post-digital age, this situates the learner as a user-producer, redefining their agency and changing the essential relationship between teacher and learner.

An holistic conception of space for learning experience

Eraut (2000) says higher education must acknowledge the value of learning that happens *in relation to* formalised learning and identifies a taxonomy of non-formal learning: learning is either deliberative, reactive, or implicit and tacit. Marsick and Watkins (2001) describe incidental learning as a by-product of activity which occurs anywhere under the control of the learner, with learning being unintended, unexpected and even unconscious. It can be learning that is taken for granted, tacit, or unnoticed. Bass (2012) says the duality of formal and informal learning is disrupted by our learners' connective behaviours and expectations. Dobozy (2014) proposes the categories of non-formal, informal, and incidental learning. Dugdale (2009, p. 53) approaches hybridity through her description of a 'whole campus approach' that values the 'space between' the formal facilities of lecture theatres, labs and classrooms. She describes "the spectrum of out-of-classroom places where knowledge sharing and study occur." These spaces include libraries, computing facilities, information commons, cafés, lounges, and residencies.

These ideas about non-formal learning space are congruent with the concept of hybridity. They convey the value of an all-embracing socially situated connective learning space: any space in which people encounter each other by choice or by chance and in which engagement or learning may be an outcome. Students engaged in non-formal learning are motivated by a range of extrinsic and intrinsic factors which can be labelled as directed, self-directed, or self-determined and convey how students enact their learning beyond, and in relation to, formal learning space. [C1]

Ontological conceptions of space and place, and themes of doing, being, belonging, becoming and connecting, establish the value of non-formal learning space and the learner's agency within it. My research pursues ideas about place in learning through consideration of friendship (Harrop & Turpin, 2013), belonging (Wilcock, 1999; Hitch *et al.*, 2014), social presence (Sung & Mayer, 2012; Leehman & Conceocao, 2010; Garrison & Anderson, 2003;

Gunawardena 1995; Short *et al.*, 1976), learning context (Herrington & Parker, 2013), learning as placemaking (O'Rourke, & Baldwin, 2016; Mannarini *et al.*, 2012; Bilandzic & Johnson, 2013), and connection-making (Siemens, 2008).

Polycontextual ecosystem

Polycontextuality describes experiencing more than one situation simultaneously (Bates & Bowman, 2015). It reflects a situated agency which involves spatial fluency as a basis for learning (Elstad, 2016). For example, the tweetchat, in which a participant may be situated concurrently in familial, professional and academic settings, requires the learner's adeptness at managing their identities, social presence, and multitasking abilities. [C2]

My case studies demonstrate how polycontextual pedagogies involve active, connective and co-operative capabilities. They are likely to be complex and evident in authentic project-based, design-based, or research-led collaborations. They involve the student navigating multiple identities of learner, leader, collaborator, friend or colleague. They can be intrinsically motivating by avoiding the over-structuration signals associated with excessive monitoring of the learner. Instead, learning through unbounded and authentic challenges need no longer be displaced in the abstracted academic realm but made vibrant through interstitial interplay across domains. The idea of hybrid learning studio suggests a notion of studio as a *place* for learning suited to post-digital age affordances and practices.

Multichronicity

The interplay between real-time and recorded time, evidenced in the making of media and its subsequent value to both producers and others [A2], disrupts the simplistic binary of synchronous-asynchronous experience to create a 'multichronous' view of learning space. This multidimensional flow of live learning conversation in which the social connectivity of the hybrid learning studio was observed in the tweetchat, establishing "an intense multi-participant and immersive conversation… [which] lives on as a learner-generated resource." [C2] Voice, as meaning agency in representing knowledge, becomes a matter of not only the act articulating and making a record of knowledge but of creating a resource full of latent potential for the social construction of

knowledge, having inherent value for deepening the learner's sense of self-actualisation.

Studio as a place of co-operation and distributed cognition

My research considers liminality, in-between spaces, the concept of third place and homeliness (Oldenburg, 1998), and ideas about studying alongside friends (Harrop & Turpin, 2013). All are significant to the rich dynamic of the hybrid learning studio as a place of belonging and peer co-operation. In-between and adjacent spaces like stairwells, corridors, cafes, and informal study areas are sites of learner agency in which learning and friendship identities merge. [C1]

Distributed cognition (Gieri & Moffat, 2003; Hutchins, 1995) frames collaboration as taking place across individuals, artefacts and internal or external representations as one cognitive system. Farias and Wilkie develop this through the idea of distributed *creation* which allows for "the active and enabling role played by the materials and technologies participating in creation processes…" (2016, p. 5). They share, with Actor-Network Theory (Latour, 2005) and Assemblage Theory (Delanda, 2016), an appreciation of the inanimate factors in a process, useful for understanding studio, not as a *built* environment, but as a multidimensional learning 'constellation' (*ibid*).

The hybrid learning studio as an assemblage of actants

Learning is enacted through situated agency in the hybrid learning studio; a form of ecological assemblage (Delanda, 2016). The studio is a fluid environment with a discernible, dynamic, structure circumscribing each participant's situation; what Giddens (1984) calls a multiplicity of systemic components and agents.

Created to frame discussion about ideas of studio for other disciplines, fig. 3 depicts an ideal hybrid learning studio as used by creative disciplines.

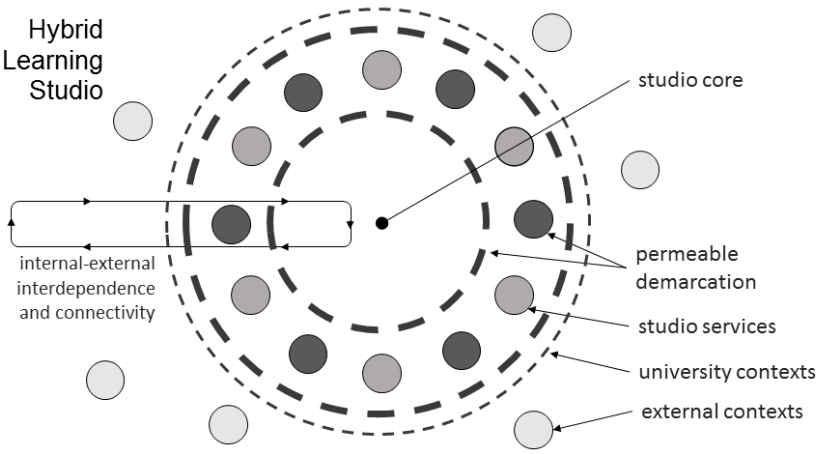


fig.3. The Hybrid Learning Studio – a concept of studio space for all

The concept puts the idea of home (Oldenburg, 1989) and fostering identity by developing a sense of belonging at its core: students identify with their study space as they work co-operatively amongst their peers. That core can be understood as a physical environment, equally, it can be more abstract, for example a hashtag (a symbol of belonging). Mostly, it is a place for connecting human, material and digital actants; a place of association, affinity and co-operation. The learner negotiates this environment: students as learners and teachers as co-constructors and facilitators, both having agency and a sense of communal responsibility. What they do, who they are, who they are becoming, and how they feel, inform their association as part of a collective spatial and ontological melange.

The studio core sits within a constellation of 'satellite services' which support, reflect and give context to acts of learning, nurturing epistemic fluency (Markauskaite & Goodyear, 2016). In this context, the learner connects theory with practice, becoming competent and professionally-minded by engaging in tasks that demand expert and creative knowledge, skills and dispositions. The learner comes to act in a state of flow (Csikszentmihalyi, 2002) being attuned to the facticity and affordances of the environment.

The learner's personal conception of studio is surrounded with a permeable demarcation which affords a liminal connectivity that reaches out to authentic situations, problems and networks which, in turn, feed into and provide context for study and opportunities for enacting knowledge.

The model of concentric circles can be read as a scaffolding map of safety and risk in support of the learner-as-apprentice in a state of becoming (Brown *et al.*, 1989).

This model distinguishes the hybrid learning studio from other pedagogical manifestations of space commonly used in higher education. For example, it is different to the lecture theatre which is a manifestation of the factory model of education characterised by its stage, delivery method, one-to-many hierarchy, and its implicit representation of knowledge as being static and transmissible (Scott-Webber, 2014; Rose, 2012). A lecture theatre has a great symbolic meaning as a structural system: its singular intention to transmit knowledge from one-to-many is unassailable.

Understanding studio as assemblage

An assemblage is,

> *a multiplicity ...made up of many heterogeneous terms and which establishes liaisons, relations between them, across ages, sexes and reigns – different natures. Thus, the assemblage's only unity is that of a co-functioning: it is a symbiosis, a 'sympathy'. It is never filiations which are important, but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind. (Deleuze & Parnet, 2006).*

Delanda has developed these ideas as Assemblage Theory. "The parts that are fitted together are not uniform either in nature or in origin, and the assemblage actively links these parts together by establishing relations between them." (Delanda, 2016, p. 2) Assemblage communicates the value of 'whole', as in 'studio as concept'. An assemblage is composed of synergistic or 'emergent properties': properties of the whole that are more than the sum of its parts. Ideas such as association, mutuality, belonging and co-production follow from this 'alloy'. An assemblage is a unique aggregation of its human and non-human components and their interactions. In a studio, for example, the knowledge, skills, dispositions, beliefs, energies, and potentials of the participants multiply and create a unique ecosystem. The components retain their independent status and value, yet they combine to function with new meaning; in this case, a multidimensional environment designed to foster learning. An assemblage is a construct of irreducible emergent properties: there

is an interdependency which, in the case of the studio as a productive space for learning, signals the value of co-operation. A co-operative ethos is the alloy or diegetic glue that connects enacted critical narratives. It, and its products, are irreducible.

Assemblage theory is useful for understanding the heterogeneity of the social world. This coalescence of a multiplicity of components, or actants, is further shared by Actor-Network Theory (ANT) (Latour, 2005). ANT “maps the social relations between people, objects, and ideas, treating all as agentic entities that form a broad network.” (Cerulo, 2009, p. 533) Müller and Schurr (2016, p. 217) note the striking similarities between ANT and Assemblage Theory as complementary theories: “Both have a relational view of the world, in which action results from linking together initially disparate elements.” ANT explains how assemblages are constructed, whereas assemblage theory accommodates a more experiential view of change and motivation. Archer (2002) argues that ANT blurs the boundaries of humans and non-humans by positioning ‘actants’ as having agency; however, Cerulo (2009) explains this is a useful way of understanding the value of anything with inviting affordances (Withagen *et al*., 2017), discussed later.

Learning, teaching and co-operation, however, are fundamentally concerned with intention and motivation and there is a danger that such theory subordinates the individual to a ‘deeply passive’ technostructure (Blaug, 2007, p. 24). Intentionality helps to distinguish between human agency and non-human affordance (Jones & Healing, 2010). Bandura (2006), for example, identifies intentionality as one of four types of agency along with forethought, self-reactiveness (self-regulation) and self-reflectiveness. He argues that humans enact their agency by intentionally influencing their life circumstances and by habitually making decisions about what to do. He says, “People are self-organizing, proactive, self-regulating, and self-reflecting. They are not simply onlookers of their behavior. They are contributors to their life circumstances, not just products of them.” (*ibid*, p. 164).

Understanding studio as a site of learning ecology and an ecology of practice

Learning is both subjective and co-operative. The individual's own context influences their motivation, thinking, ideas and actions and these develop, multiply and become more complex by interacting with, and being affected by, the affordances of the studio environment.

An ecological space is one that circumscribes learning as experiential acts of being. Such acts imbue the space with a sense of life, living, connectivity and interdependence, growth, renewal, sustainability, resilience, common purpose and achievement (Jackson & Barnett, 2020).

> The act of learning is an ecological phenomenon that brings forth new meanings and understandings of the world and of one's own being and identity in and with the world.
> (*ibid*, p. 1)

The studio is a fertile space that situates learning as an ethical matter; one that accommodates, facilitates and moderates adventurous thinking, being, and doing. The hybrid learning studio, as an ideal environmental concept, is a learning ecology, "a place where learning and the environment are indivisible." (*ibid*)

The learner emerges from the hybrid learning studio as both a fluent practitioner confident in their disciplinary knowledge, skills and dispositions and as a resilient, creative, critical and networked practitioner.

Commentary summary

In Commentary 1 I have explored the hypothesis that experiences situated within, across and beyond bounded learning spaces disrupt traditional dependencies on enclosed spaces and models of formal delivery. I have presented the inadequacy of binary representations of learning space and their reductionist influence on understandings of spaces for learning. The commentary contrasts space as a matter of managed enclosure with ideas of hybrid place in which intersection, liminality and dynamism reflect the educator's interests in the development of their students' self-actualisation and agency. Attention to human agency highlights the value of existing in and crossing

spatial and temporal boundaries. The studio concept accommodates multichronicity and polycontextuality and, when conceived as an assemblage of actants or an ecology of learning and practice, the studio stands in contrast to traditional conceptions of bounded or enclosed space as a place of situated learning.

In this first commentary, the notion of unbounded place emerges as a defining characteristic of hybrid learning studio exemplified by acts of learning navigation and negotiation.

Commentary 2: Learning agency in a networked paradigm

[Key publications: A1-4, C4, C6, and C7]

In Commentary 2 I consider the second element of the hybrid learning studio: studio as network by examining the hypothesis that,

> *agentic learner engagement through association with learning networks disrupts dependencies on learning hierarchies.*

To do this, I consider the primacy of learning as a creative act and contrast this with the teaching paradigm. The learner is discussed as agentic producer involved in acts of making media, knowledge and their sense of place in the context of learning networks.

The primacy of space for learning

While new conceptions of space for *teaching* influenced by the affordances of digital technologies and media have emerged (Baepler *et al.*, 2014), their educational premise is essentially hierarchical being either teacher or system-centred. They fail to represent holistic conceptions of space for *learning*: the "active locales that influence and are influenced by the interaction of human agents." (Strickland, 2014, p. 205)

Spatial settings affect and reflect the identity formation and self-determination of the student as navigator and negotiator of their learning (Hase & Kenyon, 2013; Blaschke, 2014). The learning environment should be considered holistically, therefore, as a site of both independent and co-operative learning agency and placemaking.

Creative agency

Graduates today should be recognisable by their creative capital (WEF, 2016); a defining attribute that explains human value in an automated world (NESTA, 2015). This small 'c' conception of creativity "locates the creative enterprise in the processes and products of collaborative and purposeful activity" requiring "more space for engaging with creativity as an outcome of pedagogical work in higher education." (McWilliam & Dawson, 2008, p. 633)

Creative capital is an outcome of generative engagement in which the learner experiences a state of flow (Csikszentmihalyi, 2002). Flow is characterised as complete involvement and focused concentration; a sense of momentarily leaving everyday realities to find inner clarity about what needs to be done, how well it is going, and belief that the activity is doable. It is experienced as serenity, and both timeliness and a loss of a sense of time passing. Flow describes an immersive state. The desire to achieve flow as a condition of learning demands a reimagining of spatial structures.

Structuration

Giddens' theory of structuration (1984) describes individuals as being agentic, interacting with the social forces that affect us. Structuration demonstrates how a situation is an inseparable outcome of the interaction of the system (e.g. 'the room' and its functional attributes, codes of practice, traditions, etc.) and its human agents. In the literature on learning spaces, others have described the interaction between space and learning as 'built pedagogy' (Monahan, 2002). Oblinger (2006, p. 1.1) describes space as a 'change agent' and defines built pedagogy as "the ability of space to define how one teaches". However, in a student-centred view, the literatures on agency, affordances, and activity theory, as well as my own case study research [C4], signals caution is needed to avoid the technological determinism which has led to influential, but disputed, beliefs such as the Net Generation and 'digital natives' (Jones & Healing, 2010).

Barr and Tagg's learning paradigm (1995) offers a non-hierachical, agentic approach to education.

The learning paradigm

Understanding the hybrid learning studio as a place of learning is explained through Barr and Tagg's learning paradigm; a disruption of teaching as control (*providing instruction*) to *producing learning* (Barr & Tagg, 1995). The *instruction* paradigm reifies the interests of the provider whereas, the principles outlining a *learning* paradigm situate the student as agent in their own learning. The learning paradigm,

- produces learning through knowledge discovery and construction;
- achieves success for diverse students;
- is successful when the classroom accommodates active exploration of knowledge through different experiences and ways of thinking;
- values the contribution of any learner;
- accommodates the learner by avoiding assumptions;
- is facilitated by resourceful teachers.

Its design,

- considers the learning experience holistically;
- pays attention to the learning environment;
- uses whatever learning experience works;
- integrates formative and summative assessment for learning.

It situates learning by valuing,

- the knowledge and experience each person brings;
- a co-operative, collaborative, and supportive ethos;
- learning environments and activities that are learner-centred and learner controlled.

These principles explain learning agency in the conceptual model of the hybrid learning studio and signal the value of learning centred on co-operative knowledge generation or co-creation: learning in the act of making.

Student-centred: space for producing learning

My case studies on audio-enhanced learning space exemplify this learning paradigm. In *Beyond podcasting* (2009) I first propose the concept of media intervention as a set of strategies for engaging students in richer spaces that demonstrate media-enhanced learning as a place of student orientation, motivation, challenge and feedback. [A1] The examples include the use of audio and video learning objects, audio briefings, audio feedback, audio FAQs, digital storytelling, connected expert voices, and audio podcast assignments. In the paper *Audio active: Discovering mobile learner-gatherers from across the formal-informal continuum* (2011), I explore audio as a space of autonomy and agency. [A2] The learner is depicted as agentic 'learner-gatherer': a maker of notes; a reflective learner analysing their experience methodically through 'a[udio]-PDP'; capturing and reviewing comments on visits and field trips; a creator and curator of testimony; and, a user of 'pocketable' video recordings in authentic situations.

The cases studies also reveal the audio-enhanced learning environment as a place of learner agency in which the teacher signals the value of talking, recording, and reflecting. This is developed in *Reconsidering the role of recorded audio as a rich, flexible and engaging learning space* (2016), in which I propose a taxonomy of reimagined active learning space: new learning activities can be devised; existing activities can be extended into new connected spaces; or, relocated temporally and spatially; or, captured and recorded to allow for re-engagement where previously learning experience has been ephemeral in nature. [A3] Audio-enhanced learning can be highly accessible, spontaneous, personal, contextualised, and pervasive. These ideas informed my later research. In *Reimaging spaces for learning in higher education* (2018), the case studies describe innovative teaching approaches which challenge out-of-date structures, and ideas about curriculum delivery and support for learning. For example, both Nortcliffe and Hides discuss their roles as provocative, having to work around systems to reveal more effective approaches. Rolfe, Eddy, and Johnston, in their own ways, embrace non-institutional open and online spaces and resources. Jones-Devitt and Steele, while rethinking their approach within the constraints of the institutional VLE, describe how they were guided by their

students to rethink learning support by embracing non-institutional space. The student Oliver Jones crowd-sourced a peer-generated resource to address an absence of adequate institutional resource, and Gary Woods engaged his students in researching and publishing a substantial online resource rather than depend upon existing publications. The student Sarah Smith developed a social media revision space which bridged academic and professional domains to establish a learning discourse with value for all participants where there had not previously been any connection. Gillin and Clarke, Beckingham, Beryl Jones, and Honeychurch and Ahmed, each set about addressing gaps in institutionally provided space by establishing new learning situations by using alternative systems. Wilmot and Rushton, LiBihan, Carter, and their respective students, turned to social media pragmatically to select tools with functionality otherwise not available to them, while France and Nugent resituate learning activities off-campus. In other case studies, David Smith, Glover and McDonald, and Fairhurst demonstrate the value of large-scale active learning spaces from an experiential and social, rather than purely functional, perspective. [C1-6]

Learning networks and placemaking

Learner-centredness establishes a tension between individual and collective agency. Orr (2010) observes the paradox in studio-based learning where assessment formally reifies the individual whose sense of being is situated within, and intrinsically dependent upon, the studio's social context; its collective agency. This context shows studio as being ontological: placemaking is pervasive and present in acts of doing, being, belonging, becoming, and connecting.

Studio is congruent with the concept of Personal Learning Networks (PLN) (Cronin *et al.*, 2016; Blaschke, 2014; Richardson & Mancabelli, 2011). A PLN is, "a set of connections to people and resources both offline and online who enrich learning" (Richardson & Mancabelli, 2011, p. 2). Both describe an open gathering place in flux, spatially, temporally and socially. Networked learning (Jones, 2004) and the PLN emphasise the individual's role and identity as a nodal conduit within a network, while Alexander (2004), citing Deleuze and Guattari (2004), points to the nomadic and transient quality of such spatial constellations. The hybrid learning studio, as network, is revealed as an

ecosystem that holds its actants and affordances in balance. It is an exciting, empowering, but also precarious, space.

I use placemaking to describe the agency that users have over a space as they make it their own. However, the term comes from urban planning where placemaking is used to describe the consultative process of shaping a public realm to maximize shared value (Wyckoff, 2014), although Thomas (2016) explores it as an outcome of socio-spatial performance.

For higher education, placemaking is concerned with feelings of a learner's satisfaction that comes from their engagement in social relationships where they identify as a spatial community (Mannarini *et al.*, 2012). However, the social environment of university campuses is changing due to a growth in the number of students working while studying, greater dependence on technology and the delivery of online content, commercialisation, competition, diversity and cost. These factors undermine opportunities for student interaction, the development of their place-based identity (Twigger-Ross *et al.*, 2003), and community engagement on campus (O'Rourke & Baldwin, 2016). This is especially the case amongst non-traditional learners (Zepke & Leach, 2010). A sense of place comes from place attachment (Scannell & Gifford, 2010), or belonging, which can be enhanced through the creation of social offerings where people can meet, and by creating a welcoming open environment (O'Rourke & Baldwin, 2016). Place identity and placemaking form a recurring theme in my case studies on learning space (Middleton, 2018). Students value being in proximity to their peers, whether they are focused and productive on task or in off-task interludes. This is true for those who are co-located physically or connected through online spaces. For example, place attachment and identity are found in the environment and its artefacts in Sarah Smith's initiative to create a socially mediated revision group, Beckingham's tweetchats, Johnston's book club, Jones-Devitt and Steele's part-time nurses, or Glover and McDonald's design students. It can also be simply *felt*, for example through the presence of lurkers or a producer's belief that a podcast, a book, or a blog has an audience, irrespective of tangible evidence. All suggest the value of making a collective investment in place and its co-regulation. Significantly, place attachment is particularly evident in testimony about social media where having

a sense of place is reflected through allegiance to a given hashtag that serves as a beacon, a hub, a badge of affiliation, a network connector, or a common reference point. [C2]

Commentary summary

In this commentary I explored the value of the learning paradigm to higher education and its implication for understanding the relationship between space and the learner. Space is experienced within an inseparable exchange of structure and agency and informs what I refer to as situated agency (Giddens, 1984). The learner is agentic and learns across the non-formal space independently and within learning networks. The learner invests in their space, developing their creative disposition through acts of knowledge creation and placemaking.

Placemaking, as a commitment to and outcome of individual and collective agency, reflects an ecosystem of co-operative learning, networked authorship and co-regulation fundamental to the concept of the hybrid learning studio.

The capacity of pervasive technology extends the learner's opportunity to establish their place attachment across previously demarcated spatial boundaries. This is explored in the following commentary.

Commentary 3: Pervasive smart connected learning

[Key publications: C2-4 and A4]

In this commentary I develop the ideas about disrupted spatial boundaries and the agency of the learner in a networked learning paradigm by considering the phenomenon of personal smart technologies and the value of fluid and connected post-digital sites of learning. To do this I propose that,

> *smart personal technologies and social media disrupt dependencies on institutionally provided learning space.*

The interstices of social and technical conceptions of studio are considered through the themes of:

- 'Knowledge as becoming' in a Connectivist paradigm
- Studio as a mediating space of embodiment
- The hybrid learning studio as an archetypal affinity space

- Spatial fluency

Pervasive and augmented space

Personal smart technologies are ubiquitous. They create a familiar and connected space for learning in which the tacit quality of lifewide experience becomes manifest. Personal devices establish a pervasive space (Kukulska-Hulme, 2010) giving the learner constant access to a rich digital and social media layer that augments their physical situation (fig. 4). They reveal the inherent 'dis-connectivity' and 'dis-location' of conventional pre-digital learning settings and suggest the inherent possibilities of digital ubiquity in a form of boundless and fluid hybrid learning studio [C2].

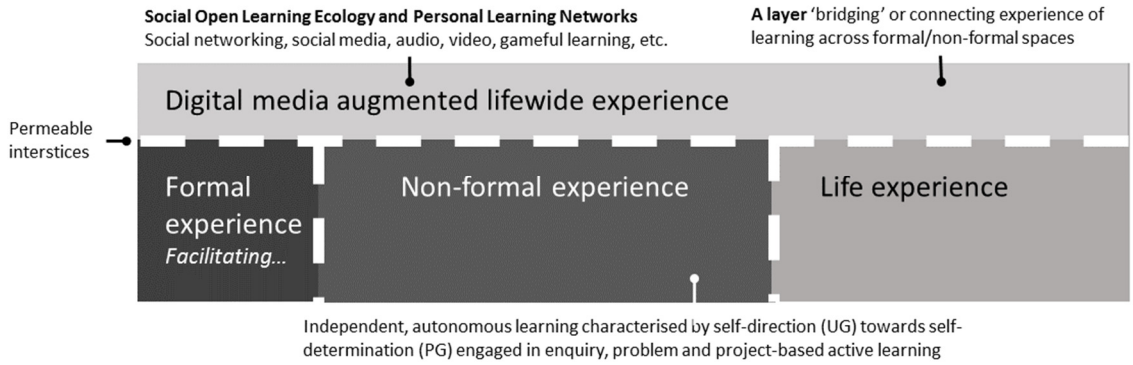


fig. 4. Augmented Learning Space

'Knowledge as becoming' in a Connectivist paradigm

Conceptually, knowledge is difficult and ambiguous. It is often a tacit outcome of exposure to diverse socially situated experiences, either intended or incidental (Polanyi, 1967). Lavé and Wenger (1991) argue learning is situated and socially constructed, challenging conventional explanations about learning as being largely a cerebral internalisation of transmitted knowledge. Barnett (2009) supports this and argues that persisting conceptions about the role of knowledge in higher education are untenable and he challenges educators to rethink the meaning of curriculum as a place of experiential and co-constructed knowledge. Advocates of studio-based learning observe that the idea of 'curriculum as knowledge' is problematic because it devalues higher forms of learning that stem from a learner's engagement with diverse lifewide experiences (Orr & Shreeve, 2018). Blackler (1995), for example, demonstrates how knowledge is embodied, embedded, 'embrained', encultured and encoded

and argues that knowing is an outcome of an active mediated, situated, provisional, pragmatic and contested process; one which disaggregates hierarchies to thrive off collaborative networks. Siemens (2005) argues that the digital context gives knowledge a dynamic quality: it is proliferated exponentially as it is shared, validated and reworked across networks.

Technology has affordances that disrupt the essential learning environment, thereby exposing alternative forms of enactment and thinking about learning and knowledge. Connectivists like Siemens argue that knowledge is inherently unstable, and it is disingenuous to students to suggest otherwise. Further, "formal education," he says, "no longer comprises the majority of our learning. Learning now occurs in a variety of ways – through communities of practice, personal networks, and through completion of work-related tasks." The value of knowledge recall and application is reduced: it is now more valuable to know where to *find* knowledge and how to evaluate it. Connectivism asserts that "knowledge is networked and distributed, and the act of learning is the creation and navigation of networks" (Siemens, 2008, p.11). Knowledge is situated in experience: learning from and with knowledge, then, is about 'being' and 'becoming' in a social context.

Connectivism is congruent with Barnett's (2000) description of 'supercomplexity' in which knowledge is a 'coming to know' but, Barnett says, this shift away from the objectification of stable knowledge, and its retention, creates profound challenges for the curriculum.

Common to these views is the idea that knowledge is ecological, growing exponentially in a state of flux and uncertainty through social interaction. Education develops knowledge and skills alongside personal dispositions. Barnett (*ibid*, p. 440) says, "working out the connection between knowing and being/becoming requires a thinking through of the kinds of human being that we want our students to become; and that is partly a matter of our value choices." The implication of this is that undergraduates need to be defined as agentic "contributors to their life circumstances, not just products of them." (Bandura, 2006, p. 164) A graduate must be creative, critical, self-aware, and self-

determined (Hase & Kenyon, 2013; Baxter Magolda, 1999); qualities found in a studio-based philosophy of co-operation, interaction, and negotiated learning.

Siemen's Connectivist principles (Siemens, 2005) epitomise an ethos of co-creative pedagogy; one which facilitates cognition through knowledge-making. Connectivist principles are evident throughout my research case studies and suggest a concept of hybrid learning studio space where 'studio' means a connected and co-operative learning space:

- Learning and knowledge rests in diversity of opinions;
- Learning is a process of connecting specialised nodes or information sources;
- Learning may reside in non-human appliances;
- Capacity to know more is more critical than what is currently known;
- Nurturing and maintaining connections is needed to facilitate continual learning;
- Ability to see connections between fields, ideas and concepts is a core skill;
- Currency (accurate, up-to-date knowledge) is the intent of all Connectivist learning activities.

A hybrid learning studio, then, is a post-digital response: a liberation from a less connected, more hierarchical instructional paradigm. In the hybrid learning studio, the learner deciphers the meaning of abundant incoming information to make choices. It becomes home to a 'pedagogy of abundance' (Weller, 2011) in which knowledge production results from self-determination and co-operation. Here, pervasive connectivity induces possibilities that bring about new ways of academic being which alter the status and role of knowledge (Cormier, 2008; Siemens, 2008). In the post-digital age, learning networks connect across spaces in an infinite ecosystem of reasoning.

Cormier (2008) develops Connectivist thinking, echoing Gee's model of self-validating distributed cognition (2005). Knowledge is not predefined by experts but negotiated and navigated through a facilitated experience of connection-making.

The studio as an assemblage and a place of social learning, therefore, exemplifies the post-digital application of situated learning and Connectivist principles.

Studio as a mediating space of embodiment

The studio is also a place of embodiment characterised as an "occupational engagement in constructing meaning. ...The doing and being of a group or population reflects its communal 'culture'." (Bilandzic & Johnson, 2013, p. 249) Studio can be understood as a complex situation in which there is a communal 'connected production of things' (Hennion & Farias, 2016). They are sites of autoethnographic learning (Barnes, 2016) and co-creation in which we learn something new through every act we take and every interaction we have with the components that make up the sociomaterial space. These components become actants in everchanging constellations (Smirnov *et al.*, 2017; St. Pierre, 2011).

Gallagher (2005, p.206) explains how embodiment relates to thinking. "Movement prefigures the lines of intentionality, gesture formulates the contours of social cognition, and, in both the most general and most specific ways, embodiment shapes the mind."

Crossley (2001) argues that embodiment is a 'whole person' conception of emotional and corporeal agency, and a matter of social agency. Building upon this, Ollis (2012) relates embodiment to emancipatory identity formation: embodiment creates a melange of learning as practice, 'know-how' or artistry (Beckett, 2008) in which the learner, through their 'intelligent body', is often driven and sustained by their emotions.

Embodiment, then, describes holistic ways of being and coming to know in the world through action and commitment to a given context. The situated curriculum is embodied and enacted and, within this, studio becomes a personalised spatial interplay of what we do, what we believe, and how we come to think and know. Orr and Shreeve (2018) observe how this characterises the art and design curriculum as it is experienced in the studio.

Whether looking at digital or material space, or a hybrid flux of polycontextual space, embodiment explains why acts of spatial navigation are significant factors affecting learning.

The hybrid learning studio as an archetypal affinity space

Hybrid learning space is an environmental concept coloured by an agent's intention, direction, and reaction. It raises questions about spatial affordances and their effect on learning experience.

The concept of affordances was developed by Gibson (1979/1986) and refers to the actionable properties between the world and an actor (a person or animal); that is, the actions made possible by an object or environment. Psychologists have gone beyond Gibson's original idea of innate possibilities arguing that affordances explain an inherent agency in objects and the environment, leading to the idea of 'inviting affordances'; influences that solicit actions and which invite the agent to feel drawn to act in a certain way (Withagen *et al.*, 2017).

Norman (2013), considering the usability of everyday things from a psychological perspective, proposes *perceived* affordances; what the user perceives rather than what is necessarily true. Norman (*ibid*, p. 14) differentiates perceived affordances from what he calls signifiers, "any perceivable indicator that communicates appropriate behaviour to a person" such as deliberate and highly visible signs labelled 'Push' and unintended signifiers, like the paint marks on an artist's floor that leave behavioural traces. Using the example of well-worn seats, the latter can be perceived as being more inviting than pristine signifiers.

Gee develops the concept of affinity spaces as a type of Semiotic Social Spaces (SSS) (Gee, 2005). SSSs describe common loci of attention and are shaped by the ways in which people think, value, act and interact. Duguid (2005) refers to these as 'networks of practices'. In education, affinity spaces are places of affiliation and sites of intrinsic learning (Gee, 2003). They are identifiable by the following features (*ibid*, pp. 225-8), paraphrased as:

1. **Common endeavour** – common interests, endeavours, goals or practices;
2. **Common space** – space does not discriminate according to experience or reputation, with each person finding different value in the space according to their own choices, purposes and identities;

3. **Strong portals** – methods of engagement allow participants to make useful contributions;
4. **Internal grammar (practices)** – the essential activity is transformed by the actions and interactions of participants;
5. **Intensive and extensive knowledge** – participants are encouraged to gain and disseminate both broad and in-depth specialised knowledge;
6. **Individual and distributed knowledge** – participants are encouraged and enabled to gain both individual knowledge and to learn to use and contribute to distributed knowledge (knowledge that exists in other people, material, places, or mediating devices);
7. **Dispersed knowledge** – participants are encouraged to use knowledge they have gained in other domains;
8. **Tacit knowledge** – participants use and honour knowledge built up from experience but which may be difficult to articulate coherently;
9. **Diverse forms and routes to participation** – participants engage using many different forms and routes;
10. **Different routes to achieving status** – people demonstrate, and are known for, their different strengths;
11. **Porous leadership as leaderly resources** – leadership is embodied in many people and takes many forms according to the different demands, opportunities and interests afforded by the space.

In considering studio as a site of networked learning, affinity spaces are more useful than the idea of communities of practice (Wenger *et al.*, 2002) which presupposes a commitment to membership (Gee, 2005). The concept of hybrid learning studio is an archetypal affinity space: an holistic, experiential and co-operative site incorporating myriad mediating devices, each with inviting affordances, which encourage the use and development of distributed knowledge by teams or through loosely associated networks of practices. Affinity spaces reward students for networking, recognising them as much as for

their contribution as for their individual achievement and this results in students learning to gain and utilise widely dispersed knowledge.

Spatial fluency

Sociologist and philosopher Henri Lefebvre describes space as, “not a thing, but rather a set of relations between things (objects and products)” (1974/1991, pp. 82-83). Space, then, can be conceived as a plethora of interweaving networks, spheres, or atmospheres (Anderson, 2009) in which, to differing degrees, its animate and inanimate actants have a presence of perceived inviting affordances.

Embodied learning and interactive affinity spaces are evident in studio studies. Ash (2016) considers the interactive affordances of material settings and human participants and the effect of their presence on each other. He cites Anderson’s idea of studio as being a continuously shifting, open and inherently ambiguous assemblage of elements. The studio setting accommodates diverse types of encounter to form a constantly emergent coming together of human participants and objects.

This coming together can be real or felt as social presence. Sung and Mayer (2012) describe social presence as the degree of interpersonal connectivity, evident in feelings of respect or being noticed, the sharing of information and beliefs, interactivity, the development of common identity, and acts of social intimacy. Social presence can counter potential feelings of anomie (Garrison & Anderson, 2003; Short *et al.*, 1976). Gunawardena (1995) adds that presence is about having a heightened reality.

When considering the concept of space, place, or studio it is necessary to acknowledge their intrinsic bias and complexity. Social media tools, sites and services, for example, which may appear to be ‘free’, are vested in obscure and problematic interests. Space is not value-free. Humans manage space by contriving parameters and this framing inevitably introduces distortions (Stirzaker *et al.*, 2010). Its affordances are intrinsically biased and persuasive, whether they appear to be neutral or evidently determined by other interests. Spatial affordances are not benign, therefore; they have consequences which belie a person’s self-perceived sense of agency. For example, the use of a

research hypothesis as a site of investigation is affected by the author's experience or ecology, however objective the intentions and methods behind the investigation may have been. Objectivity is usually considered to be an ideal for scientific inquiry; however, the value-free ideal is exposed to intrinsic biases present in the choice of subject, the gathering of evidence, the acceptance of hypothesis as being an adequate and reliable research device, and the proliferation and application of the results. (Reiss & Sprenger, 2014) More generally, space and the concept of hybrid learning studio, whether material, digital or hybrid by design, are fundamentally complex (Cilliers, 2005) and contrived assemblages that need to be navigated critically. Blackmore (2008), for example, discusses the contrivance of the meme ('that which is imitated', Dawkins, 1976) and its ability to transform. Often experienced as being innocuous, Blackmore argues that a meme is an evolutionary device in which each person acts as replicator. Ecologically, she says, "We humans like to think we are the designers, creators and controllers of this newly emerging world but really we are stepping stones from one replicator to the next." Classroom, social media, and technologies may facilitate a learner's agency but, along with other spatial types, they qualify agency because they are inevitably value-laden.

In my case studies on spaces for learning, respondents are conscious of the interrelatedness of space and presence and how they affect learning [C1-C2]. Matt Johnston talks about presence as outcome of global connectivity in which people handle common artefacts in the distributed phenomenon of his Photobook Club. Sue Beckingham, in the LTHEchat case study, refers to the intense value of invisible presence felt in the social media space.

The implication of dual presence in the polycontextual phenomenon of the digital backchannel (Ross *et al.*, 2011) clarifies the need to reimagine learning space more generally: the backchannel is a "multidirectional complex space" in which participants are highly productive as multi-tasking co-producers of knowledge, sometimes enacting informal and non-formal behaviours concurrently and productively across the extended learning environment [C2]. Savin-Baden (2015) refers to this as an indiscriminate digital tethering, one that requires "an increasingly sophisticated array of multiliteracies" which form the critical digital literacies that must define graduates (Amidon, 2016, n.p.).

A ‘pedagogy of ambiguity’ (Austerlitz *et al.*, 2008) is also identified as a defining characteristic in the ‘sticky’ concept of studio pedagogy in which there is a “pervading sense of uncertainty, where practice is messy and full of unknowns”; Masson’s (1993) place of ‘safe and unsafe uncertainty’. (Orr & Shreeve, 2018, p.12)

Individual and collective networked agency is evident in my research and found, for example, in the use of the social media hashtag as a locus of presence and activity. In a Connectivist learning paradigm, individual agency is socially situated. It requires a collective agency; a co-operative relationship that generates distributed knowledge as part of a studio ecosystem. A studio space can be thought of, therefore, as a reflexive ecology of networked relationships characterised by ambient and intended interaction.

Spatial affordances are perceived differently and embodied as an ecology of responses that reflect a learning discourse that is both explicit and tacit. A coherent learning space requires a diegetic glue of individual and social enacted critical narratives. Students, teachers, and facilities managers need spatial literacy to analyse the functional setting, its affordances and desirable learning behaviours and expectations, therefore. This literacy informs the development of the critical narratives needed for imagining and reflecting on studio-based learning by supporting the navigation and evaluation of learning and practice-based associations, intentions, interests and biases. It scaffolds personal and social acts of navigating the ambiguous space.

With reference to flow theory (Csikszentmihalyi, 2002), fluency describes a person’s complete involvement and focused concentration giving them the wherewithal to respond to situations with agility. As a dimension of the hybrid learning studio, I argue that spatial *fluency* is a post-digital proposition congruent with Savin-Baden’s (2015, p. 43) conclusion that a person’s “constant interaction and engagement with digital technology” requires higher education to reconstitute learning and teaching around the development of digital fluency. McLaughlan and Lodge (2019) argue that students need to develop their deeper knowledge by looking beyond technological essentialism to appreciate the fundamental relationships at play. Co-operative pedagogies, like networked

practices in general, are disruptive because they inherently require fluency through autonomous navigation and negotiation of a situation. Similarly, the affordances of rich media and personal smart devices inevitably dissolve anachronistic dependences upon fixed connotations of time and space as generally represented in institutional learning management systems, as noted in post-digital discourse (Sinclair & Hayes, 2019).

Commentary summary

The phenomenon of personal smart technologies is indicative of real disruptive behaviours that situate the learner in unbounded and connected spaces. The Connectivist learning paradigm contrasts with conventional conceptions of managed, structured learning space and reflects the ambiguity and fluidity associated with the studio learning environment; a place in which knowledge and becoming are products of an embodied and encultured curriculum.

Further, the hybrid learning studio influences learning cultures, having perceived and inviting affordances that solicit certain behaviours. Such a studio learning space supports a reflexive ecology of networked relationships. It is post-digital; an archetypal affinity space and a liberation from disconnected and hierarchical conceptions of learning space. It accommodates and recognises the value of an infinite ecosystem of reasoning. However, such a space requires the development of spatial literacies that lead to a fluency that allows students and their teachers to successfully negotiate, navigate and exploit the environment.

Commentary 4: Authentic and active learning

[Key publications: A3-A4, and C5-6]

In Commentary 4 I explore studio as a place of purposeful dialectic productivity as a further dimension of the hybrid learning studio. Studio is a site of authentic learning experienced as co-production and co-creation, live to ill-structured and changing contexts. I examine the hypothesis that,

> *rich, experiential and active learning disrupts dependencies on content-centred models of teaching.*

I consider studio as,

- learner-generated context
- site of co-operative learning
- site of co-production
- a space for authentic design thinking and distributed authorship
- a site of authentic enactment

Studio as learner-generated context

The studio is a place of situated learning. Situated learning,

> *"emphasises the relational interdependency of agent and world, activity, meaning, cognition, learning, and knowing. It emphasises the inherently socially negotiated character of meaning and the interested, concerned character of the thought and action of persons-in-activity." (Lavé & Wenger, 1991, p. 50)*

In this conception, the studio affords a dialectic system of activities, tasks, functions, and understandings which work as one, supporting legitimate peripheral participation (*ibid*). It promotes positive interdependence (Johnson & Johnson, 2009) and networked learning (Ryberg *et al.*, 2012), being a fluid site of participation, connectivity and becoming.

Studio is experienced as home space: a place to which the learner or practitioner returns from gathering data to work it up. It is a place of connection in which design culture and process become one (Beeson, 2008). It goes beyond the problem of 'content': something known, definite, deliverable, consumable and irreducible (Boling & Schwier, 2016). Space defined by content denies the learner their role as social agent in the production of emergent and distributed knowledge. Rather than 'drilling' facts or processes, the studio is an ecosystem of shared circumstances; a stage which fosters the development of cognitive and active habits, promotes reflection, and develops knowledge and identity-building through embodied negotiation. The studio is a place of co-production (exchange) and co-creation (situated making), a learner-generated context "created by people interacting together with a common, self-defined learning goal… [where the context is] …generated through the enterprise of

those who would previously have been consumers." (Luckin *et al.*, 2011, pp. 72–73)

Studio as a site of co-operative learning

I have been guided by Chickering and Gamson's set of established principles for good practice in undergraduate education (1987), which,

> *"develops reciprocity and co-operation among students... good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding." (ibid, p. 3)*

However, the theory of co-operative learning remains largely untheorised, being a 'bundle' of dynamic and intersecting ideas (Ross & Noble, 2020). Centred on reciprocity, it is often confused with collaborative learning (Dalsgaard & Paulsen, 2009). While the studio is often described as a collaborative learning space (Cennamo *et al.*, 2011), this implies common purpose and social *dependency* and does not sufficiently explain the psychological rationale of a generative learning context (Johnson & Johnson, 2009). Johnson and Johnson argue that a psychology of positive *interdependence* is needed. Interdependence is ecological and fundamental to co-operation: it establishes the individual as an entity situated within and part of a social assemblage. Johnson and Johnson identify five variables that mediate co-operative efficacy: positive interdependence, individual accountability, promotive interaction, the appropriate use of social skills, and group processing. While they also emphasise the importance of common goals in motivating the group to act towards their accomplishment, caution is needed.

Studio need not be a place of consensus. Instead, it is often characterised by its diversity. Creativity accommodates dialectic thinking in which contradictions can co-exist without needing resolution (Paletz *et al.*, 2015). Common endeavour, rather than common goals, is more useful to understanding studio as a motivating place of affiliation, an affinity space (Gee, 2005), and home space (Oldenburg, 1998). The actant's sense of proximity and co-presence lead to 'promotive interaction' where the multitude of beings (Heidegger, 1927/1996) coalesce to create social agency and purpose as discussed in the *Closer!*

project [A1], in terms of intimacy [A3], throughout Middleton (2018) [e.g. C1, C2, C5], and the ecology of the studio [A4].

Co-operative learning is part of a studio-based culture of co-production, co-creation, and contribution, evident in formal, informal, and non-formal relationships.

Studio as a site of co-production

The concept of co-production originates in the 1970s (Alford, 2014; NEF, 2008) and was adopted by Edgar Cahn (2000) in social care, and subsequently applied in other fields (Filipe *et al.*, 2017; Humphreys & Grayson, 2008), including in higher education (McLoughlin & Lee, 2008).

Co-production considers the interrelationship of people, space and product. [C2-3, C5, C6-7] It aligns with the concept of Web 2.0 which informed my research into educational audio: harnessing collective intelligence; the richness of user experience; space as platform; open-ended and agile development; co-operation over control; users add value; and agentic data (O'Reilly, 2005). [A2]

In higher education, co-production is used to describe knowledge as a product of "an exploratory space and a generative process" involving unexpected forms of knowledge, values, and social relations (Filipe *et al.*, 2017, p. 1). It is discussed, for example, in terms of learner-generated assignments [A1-3], in acts of social making (e.g. revision notes and the tweetchat feed [A3, C2]) or in consideration of makerspaces [C6].

By developing principles originally devised by Boyle *et al.* (2010) to promote social change, co-production can be seen to offer a philosophical framework for a co-operative learning studio:

- Recognising people as partners having equal value in the co-construction of knowledge;
- Building on and developing people's existing capabilities by creating opportunities to develop them;
- Valuing mutual and reciprocal partnership;

- Valuing the potential of peer and personal networks alongside the input of professionals or people assigned expert status;
- Blurring the distinction between people assigned expert status, including professionals, and those whose formal or informal interest, experience, knowledge and commitment are not sufficiently valued or recognised;
- Expecting experienced and knowledgeable people to facilitate learning, acting as change agents in activities that lead to mutually beneficial outcomes;
- Devolving responsibility, leadership and authority to participants, and encouraging self-organisation rather than assuming direction from above;
- Expecting all participants to grow their capabilities and make use of them as changing situations allow;
- Offering participants a range of incentives which help to embed the key elements of reciprocity and mutuality.

Studio as a space for authentic design thinking and distributed authorship

Tomorrow's professionals require an enhanced capacity for collaboration, co-operation and creative thinking, and the ability to solve complex problems (Markauskaite & Goodyear, 2016); attributes which can be outcomes of design thinking as a studio-based pedagogy. Design thinking is a creative human-centred change model structured around problem-solving (Brown, 2019; Morris & Warman, 2015). Design thinkers (Sharples, 2019; Rowe, 1987),

- explore diverse and competing perspectives before deciding on solutions;
- combine interdisciplinary knowledge and skills to generate solutions;
- focus on making products;
- explore how their designs can respond to human needs;

- are adept team workers with strong interpersonal skills able to work effectively in groups towards a common goal;
- are action oriented.

Design thinking exemplifies studio-based learning and includes creative processes such as experimenting, creating and prototyping models, soliciting feedback, and redesigning (Sharples, 2019). The studio context is configured for authenticity, so the learner generates and evaluates solutions to real needs by thinking like a designer. It is a dialectical process which accommodates and values different perspectives in problem resolution. It involves several phases: Empathy, Define, Ideation, Prototype, and Test (Morris & Warman, 2015), and can be applied to any subject area in which products and services are created to address people's needs. Beligatamulla *et al.* (2019) found it offers a participatory approach towards solving global issues and develops an open, explorative attitude, creative ability, and an ethical mindset. Design thinking is characterised by "the uncertainty of divergence and the integrative, head-hurting complexity of synthesis… [which] are the very experiences that make this type of creative thinking both challenging and liberating at the same time." (Jackson & Buining, 2010)

Studio-based learning tackles ill-defined, complex problems (Dam & Siang, 2019; Cennamo *et al*., 2011) through the explorations of uncharted territory (Dineen & Collins, 2005) which Schön (1987, p. 42) has previously noted deal with "many variables and constraints, some initially known and some discovered through designing." This exploration generates multiple possible solution paths. It feels open-ended and full of ambiguity (Orr & Shreeve, 2016; 2018). In this way, the studio not only allows for negotiation; its implicit learning challenge is to be agentic in addressing the ambiguous.

McLaughlan & Lodge (2019, p. 81) argue "epistemic environments require the continuous exercise of design thinking by both teacher and learner." Design thinking and studio-based pedagogies epitomise epistemic fluency (Markauskaite & Goodyear, 2016) in which the studio is a multi-layered and multidimensional place of being. [A2] This arena nurtures agentic enactments of epistemic fluency:

- connecting theory with practice;
- acting as a professional (with regard to competency and identity);
- practising relational expertise (the ability to communicate and collaborate with other professionals and laypeople);
- exercising a capacity for innovation;
- being attuned to the affordances and constraints of the environment in which one is acting and adapt it to suit the task at hand.

Beyond Web 2.0 (O'Reilly, 2005), Sfard's idea of learning by participation (1998), and Collis' (2009) contribution-oriented approach to learning (fig. 5) influenced my thinking on audio as a learning space [A1-3]. Collis presents a taxonomy of learning activities which frames the learner as co-creator of content.

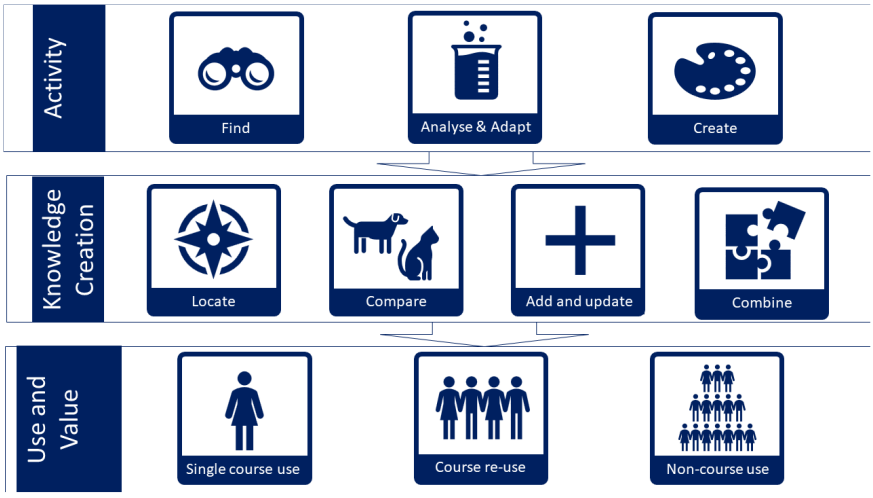


fig 5. Contribution-oriented pedagogy framework

The learner becomes a co-designer of artefacts that have both value for themselves and their peers. They have a contribution role which involves exploration and discovery, knowledge creation and sharing, collaboration and contribution, and authentic assessment. This role is evident in many of my case studies, but notably in the work of Sara Smith who established a socially mediated revision network [C2]; Oliver Jones who co-ordinated the construction of an online medical knowledgebase for his peers [C5]; and Gary Wood whose students co-created an online Linguistics encyclopaedia [C5].

Here, the network demonstrates the studio as a site of collective agency acting as producer, critical friend, and authentic audience and user. Beyond contribution, co-creative learning becomes an encompassing philosophy of participation and distributed authorship. This is evident in my case studies on tweetchats as a space for learning and in Matt Johnston's Photobook Club project [C2]. Johnston situated the photobook as a device around which globally distributed 'clubs' co-constructed knowledge exemplifying the physical photobook as actant artefact (Latour, 2005). The book club, then, is a site of networked authorship. Callahan (2013), with reference to bell hooks (2012), advocates the idea of distributed authorship as a way to disrupt learning and teaching hierarchies so as to remove hidden biases that exclude all but traditional conceptions of the student. Challenging technological essentialism, Callahan offers a feminist critique of technology-enhanced models of co-creation: technology does not *cause* disruption but can afford "a disruption to the industrialized, two-tiered model of educational inequality."

Learning as co-creation is a form of deep exploration involving distributed and negotiated authorship. Conducting an inquiry requires empathy, mutual clarification, ideation, debate and discussion towards resolution and the production of new situated knowledge. Callahan shows how distributed authorship is conversational, exemplified by her online community of voices whose conversation is facilitated "through photo essays, videos, and student journal accounts, resulting in a semester-long, multimedia-rich 'participatory archive'." In a co-creative ethos of distributed authorship, students assume mutual responsibility for knowledge building by agreeing to put their ideas on the line.

Barnes (2016), discussing hybrid pedagogy, considers blogging as a highly personal act of writing to a global audience, making it a social act of co-creation and networked authorship. She discusses the influential danger and criticality of exposure. "Nearly every time I write, I learn something new... Either I am challenged or I work something out by myself through the crystallizing process of placing thoughts on a page." Dalsgaard and Paulsen (2009) describe this phenomenon as 'transparency' in co-operative online learning; a form of *agencement* (Hennion & Farias, 2016). For Barnes, her writing becomes a

performance through its publication; an act of public thinking (Beichner, 2014). Similarly, Acton (2017, p. 1441) discusses blogging as a type of mediating learning space; a form of,

> *"...sociomaterial assemblage, an entanglement, with scholarly learning, teaching, institutional agendas, architectural intent, technology, staff, students, pedagogic outcomes, and built form [with] all participants in an active symbiosis of becoming."*

It presents studio as a 'relational ontology' (*ibid*) reflecting a student's spatial experience and not primarily concerned with material and digital space.

Mapping epistemic fluency to a studio-based learning paradigm, McLaughlan & Lodge (2019) explain, "The studio blends problem and inquiry-based learning using a cognitive apprenticeship model and requires a design-based solution to a problem that is only loosely defined for the student." This involves their students in a process of identifying and raising questions, seeking knowledge and putting it into practice, prototyping (e.g. making work public), evaluation, and refining the design problem. The studio becomes a space for the student to deal with ill-defined problems by obtaining knowledge necessary for conducting their inquiry. Feedback is continuous and critical, and reflection is integral to the learning process. There is nothing ritual or superficial about learning this way, it is authentic, and the personalised nature of studio-based problems means that design thinking is inevitably gritty, hard thinking.

Hennion explains that studio is a site, a sociomaterial construct, in which there is a "connected production of things" in an entanglement of factors (Hennion & Farias, 2016, p. 76). Entanglement, uncertainty and complexity are dimensions of an authentic learning space, which Herrington and Parker (2013) frame as:

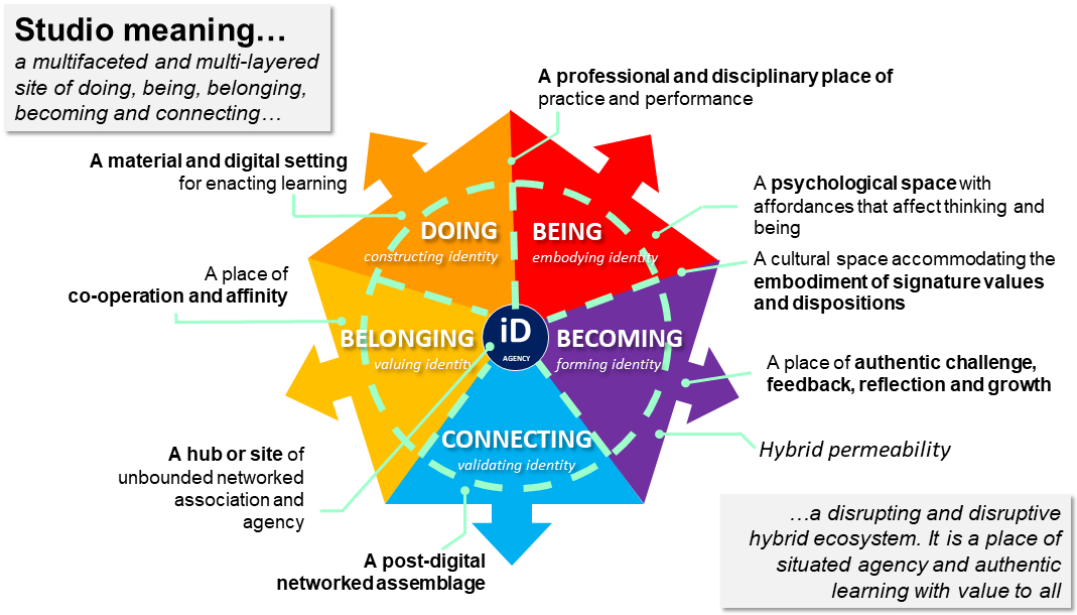
1. An authentic context, having real-world relevance;
2. Authentic activities and tasks;
3. Access to expert performances and the modelling of processes;
4. Multiple roles and perspectives;
5. The opportunity to collaborate;
6. The opportunity to reflect;
7. Opportunities to articulate knowledge and thinking;
8. Coaching and scaffolding at critical times;
9. Tasks which are seamlessly integrated with assessment.

Commentary summary

In this commentary I have considered the hybrid learning studio as a place of purposeful dialectic productivity. The studio's authenticity comes through co-present acts of co-production and co-creation; a plurality of immersive ill-structured learning activities that thrive through frisson and affinity. My research demonstrates how acts of rich, experiential, active and authentic learning disrupt dependencies on content-centred models of teaching.

Concluding commentary: Towards the studio as an agentic site of co-operative learning for all

The commentaries have discussed how the concept of studio disrupts dualistic conceptions of formal-informal, physical-virtual learning space and is, instead, a multifaceted and multi-layered site of doing, being, belonging, becoming and connectivity. (fig. 1, reproduced).



The relevance of the Hybrid Learning Studio for non-artistic disciplines

The Hybrid Learning Studio, as an ideal model, is relevant to non-artistic disciplines. The model can be applied in several ways reflecting the many meanings associated with 'studio'. It can be a,

- functional setting for enacting learning, having tools, affordances, and practices
- networked assemblage and ecology of practices

- place of professional and disciplinary practice and shared identity
- psychological space with affordances that affect thinking, behaviours, and dispositions
- social space of collaboration, co-operation and affinity
- cultural space accommodating the embodiment of signature beliefs and dispositions
- hub or site of unbounded connection and association

In its many meanings, studio is a place of contestation forming a disruptive hybrid ecosystem. It is a place of situated agency and authentic learning with value to all. It is a multifaceted and multi-layered site of doing, being, belonging, becoming and connectivity.

Pedagogically, the studio is a place of,

- stimulation and endeavour
- epistemological fluency
- independent and collective agency and voice
- complex knowledge, 'coming to know', and self-actualisation
- personal and social enactment, embodiment, and co-presence
- unbounded vibrancy and authentic learning
- affinity, association and connectivity
- self-direction, self-determination and co-operation
- authorship, contribution, reciprocity, and support.

For the non-artistic discipline, the student as studio learner can be reconceptualised as producer of knowledge, not just a recipient, and as co-producer in a culture of co-operation, collaboration and exchange. The hybrid learning studio accommodates their diverse paths and aspirations as, together with their peers and tutors, they devise, negotiate and navigate their learning and develop their thinking habits as they come to their knowledge. "Students and staff live *through* space, and their presence and sense of belonging is critical to achieving personal and course identity, and successful outcomes." [C7]

The hybrid learning studio is a psychological, social, cultural, post-digital assemblage: an unbounded constellation of places.

The common thread in my research is the disruption of spatial conceptions. This review of my publications reveals *place* to be a more useful discourse for describing sites of experiential learning in the post-digital age. Within this body

of work ideas of ‘voice’ are recurrent, literally and in the sense of reciprocal support, participation, contribution, and authorship. The value of generative situations and co-creation emerge and situate knowledge as an outcome of learner agency, co-production and co-creation. My publications reveal a broad idea of studio as a place of stimulating and authentic learning; one that can promote and reflect the complexities of knowledge and the agency of any student, whatever their epistemic identity.

The publications incorporated in this thesis, alongside these commentaries, demonstrate the many positive, disruptive and converging influences that, together, challenge simplistic conceptions of higher education learning space and situate the learner as agent central in their own learning ecosystem.

Thesis References

Acton, R. (2017). Place-people-practice-process: using sociomateriality in university physical spaces research. Educational Philosophy and Theory, 49(14), pp. 1441–1451. https://doi.org/10.1080/00131857.2017.1309637

Alexander, B. (2004). Going nomadic: mobile learning in higher education. EDUCAUSE review, September/October 2004. https://net.educause.edu/ir/library/pdf/ERM0451.pdf

Alford, J. (2014). The multiple facets of co-production: building on the work of Elinor Ostrom. Public Management Review, 16(3), pp. 299-316, DOI: 10.1080/14719037.2013.806578

Amidon, T. (2016). (Dis)owning tech: ensuring value and agency at the moment of interface. Hybrid Pedagogy, September 2016. Online at: https://hybridpedagogy.org/disowning-tech-ensuring-value-agency-moment-interface/

Anderson, B. (2009). Affective atmospheres. Emotion, Space and Society, 2(2), pp. 77-81.

Archer, M. (2002). Realism and the problem of agency. Journal of Critical Realism 5, pp. 11–20.

Ash, J. (2016). Theorising studio space: spheres and atmospheres in a video game design studio. In: Farias, I. & Wilkie, A., eds, "Studio studies: operations, topologies and displacements". Abingdon: Routledge.

Austerlitz, N., Blythman, M., Grove-White, A., Jones, B.A., Jones, C.A. Morgan, S., Orr, S., Shreeve, A., & Vaughan, S. (2008). Mind the gap: expectations, ambiguity and pedagogy within art and design education. In: L. Drew, ed., "The student experience in art and design higher education: drivers for change". Cambridge: Jill Rogers Associates Ltd Publishers, pp. 125-148.

Baepler, P., Brooks, D.C. & Walker, J.D., eds. (2014). Active learning spaces. New Directions for Teaching and Learning, 137, San Francisco: Jossey-Bass.

Bandura, A. (2006). Toward a psychology of human agency. Perspectives on Psychological Science, 1, pp. 164 –180. Doi:10.1111/j.1745-6916.2006.00011.x

Barber, M., Donnelly, K. & Rizv, S. (2013). 'An avalanche is coming: higher education and the revolution ahead' In: The Institute of Public Policy Research. http://www.ippr.org/images/media/files/publication/2013/03/avalanche-is-coming_Mar2013_10432.pdf

Barnes, N. (2016). Messy minds: the autoethnography of learning. Hybrid Pedagogy. Available online: http://hybridpedagogy.org/messy-minds/

Barnett, R. (2013). Imagining the university. Routledge, New York and London.

Barnett, R. (2009). Knowing and becoming in the higher education curriculum. Studies in Higher Education, 34(4), pp. 429-440.

Barnett, R. (2000). University knowledge in an age of supercomplexity. Higher Education, 4(4), pp. 409-422.

Barnett, R. & Jackson, N. (2020). Ecologies for learning and practice: emerging ideas, sightings, and possibilities. Abingdon & New York: Routledge.

Barr, R. & Tagg, J. (1995). From teaching to learning: a new paradigm for undergraduate education, Change, November, pp. 13-25.

Bates, C. & Bowman, H. (2015). Skills support as border straddling: negotiating liminality with adult learners. SCUTREA Conference, Weetwood Hall Conference Centre, Leeds, 7-9 July 2015.

Baxter Magolda, M. B. (1999). Creating contexts for learning and self-authorship. Vanderbilt University Press.

Becher, T. & Trowler, P. (2001). Academic tribes and territories: intellectual enquiry and the culture of disciplines, 2nd edition. Buckingham: Open University Press.

Beckett, D. (2008). Holistic competence: putting judgements first. Asian Pacific Educational Review, 25(3), 291-305.

Beeson, S. (2008). Studio: a precedent from practice, a method for the mind. Proceedings of "50 years on: resetting the agenda for architectural education", 22nd July 2008 at The Oxford Conference.

Beichner, R. (2008). The SCALE-UP project: a student-centered active learning environment for undergraduate programs. An invited white paper for the National Academy of Sciences, September 2008. Online at: http://physics.ucf.edu/~bindell/PHY%202049%20SCALE-UP%20Fall%202011/Beichner_CommissionedPaper.pdf

Beichner, R.J. (2014). History and evolution of active learning spaces. New directions for teaching and learning, 137, Special Issue: Active Learning Spaces.

Beligatamulla, G., Rieger, J., Franz, J. & Strickfaden, M. (2019). Making pedagogic sense of design thinking in the higher education context. Open Education Studies, 1(1), pp. 91-105. DOI: https://doi.org/10.1515/edu-2019-0006

Bilandzic, M. & Johnson, D. (2013). Hybrid placemaking in the library: designing digital technology to enhance users' on-site experience. The Australian Library Journal, 62:4, pp. 258-271, DOI: 10.1080/00049670.2013.845073

Blackler, F. (1995). Knowledge, knowledge work and organizations: an overview and interpretation. Organization Studies, 16(6), pp. 1021–1046.

Blackmore, S. (2008). Temes: an emerging third replicator. On the Human: a project of the National Humanities Centre website. Online at: https://nationalhumanitiescenter.org/on-the-human/2010/08/temes-an-emerging-third-replicator/

Blaschke, L. (2014). Using social media to engage and develop the online learner in self-determined learning. Research In Learning Technology, 22. doi:http://dx.doi.org/10.3402/rlt.v22.21635

Blaug, R. (2007). Cognition in a hierarchy. Contemporary Political Theory, 6(1), pp. 24-44.

Boling, E. & Schwier, R.A. (2016). Curators' notes. In: E. Boling, Schwier, R.A., Gray, C. M., Smith, K. M. & Campbell, K. "Studio teaching in higher education: selected design cases", New York: Routledge, pp. 4-20.

Boyle, D., Coote, A., Sherwood, C. & Slay, J. (2010). Right here, right now: taking co-production into the mainstream. NESTA Discussion paper: https://media.nesta.org.uk/documents/right_here_right_now.pdf

Brandt, C.B., Cennamo, K., Douglas, S., Vernon, M., McGrath, M. & Reimer, Y. (2013). A theoretical framework for the studio as a learning environment. International Journal of Technological Design Education, 23, pp. 329–348. https://doi.org/10.1007/s10798-011-9181-5

Brown, J. S. (1999). Learning, working, and playing in the digital age. Online at: http://serendip.brynmawr.edu/sci_edu/seelybrown

Brown, J. S., Collins, A. & Duguid, P. (1989). Situated cognition and the culture of learning. Educational Researcher, Vol. 18, No. 1. (Jan. – Feb., 1989), pp. 32-42.

Brown, T. (2019). Change by design: how design thinking transforms organisations and inspires innovation. New York: HarperCollins.

Bruner, J. S. (1960). The process of education. Cambridge, Mass.: Harvard University Press.

Burwell, K. (2016). 'She did miracles for me': an investigation of dissonant studio practices in higher education music. Psychology of Music, 44(3), pp. 466-480.

Cahn, E. (2000). No more throwaway people: the co-production imperative. Washington: Essential Books.

Callahan, V. (2013). Toward networked feminist scholarship: mindful media, participatory learning, and distributed authorship in the digital economy. Cinema Journal, Fall 2013, 53(1), pp.156-163.

Cennamo, K., Brandt, C., Scott, B., Douglas, S., McGrath, M., Reimer, Y. & Vernon, M. (2011). Managing the complexity of design problems through studio-based learning. Interdisciplinary Journal of Problem-Based Learning, 5(2). https://doi.org/10.7771/1541-5015.1253.

Cerulo, K. A. (2009). Nonhumans in social interaction. Annual Review of Sociology 35, pp. 531–52.

Chickering, A. W. & Gamson, Z. F., eds. (1987). Seven principles for good practice in undergraduate education. AAHE Bulletin: March, pp. 3-7.

Christensen, C. M. (1997). The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business Review Press.

Cilliers, P. (2005). Knowledge, limits and boundaries. Futures 37, pp. 605–613.

Collis, B. (2009). Contribution-oriented pedagogy. Encyclopaedia of Distance Learning, Second Edition.

Cormier, D. (2008). Rhizomatic education: community as curriculum. Innovate: Journal of Online Education, 4(5), June/July 2008, article 2. Online at: http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1045&context=innovate

Cronin, C., Cochrane, T. & Gordon, A. (2016). Nurturing global collaboration and networked learning in higher education. Research in Learning Technology, 24. Doi: http://dx.doi.org/10.3402/rlt.v24.26497

Crossley, N. (2001). The social body: habit, identity and desire. London: Sage.

Csikszentmihalyi, M. (2002). Flow: the classic work on how to achieve happiness. London: Rider.

Dalsgaard, C. & Paulsen, M. F. (2009). Transparency in cooperative online education. The International Review of Research in Open and Distributed Learning, 10(3). https://doi.org/10.19173/irrodl.v10i3.671

Dam, R. & Siang, T. (2019). 5 stages in the design thinking process. Interaction Design Foundation. Online at: https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

Daskalaki, M., Butler, C.L. & Petrovic, J. (2012). Somewhere in-between: narratives of place, identity, and translocal work. Journal of Management Inquiry, October 2012; 21(4), pp. 430-441.

Dawkins, R. (1976). The selfish gene. Oxford: Oxford University Press.

De Laat, M. & Lally, V. (2003). Complexity, theory and praxis: researching collaborative learning and tutoring processes in a networked learning community. Instructional Science, 31(1), pp. 7-39.

De Greef, L., Post, G., Vink, C. & Wenting, L. (2017). Designing interdisciplinary education: a practical handbook for university teachers. Amsterdam University Press.

Delanda, M. (2016). Assemblage theory. Edinburgh: Edinburgh University Press.

Deleuze, G. & Guattari, F. (2004). A thousand plateaus: capitalism and schizophrenia. Translation: Brian Massumi, Minneapolis: University of Minnesota Press, 1987 (originally published as Mille plateaux, Paris : Éditions de minuit, 1980).

Deleuze, G. & Parnet, C. (2006). Dialogues II. London: Continuum.

Dennen, V.P. & Burner, K.J. (2007). The cognitive apprenticeship model in educational practice. In: J. Michael Spector , M. David Merrill , Jeroen van Merriënboer , Marcy P. Driscoll, eds., "Handbook of research on educational communications and technology", Abingdon: Routledge.

Dineen, R. & Collins, E. (2005). Killing the goose: conflicts between pedagogy and politics in the delivery of a creative education. International Journal of Art & Design Education, 24(1), pp. 43-52.

Dobozy, E. (2014). Using the theory and practice of 'built pedagogy' to inform learning space design. In: L. Scott-Webber, J. Branch, P. Bartholomew, & C. Nygaard, eds., "Learning space design in higher education." The Learning in Higher Education series, Farringdon, Oxon: Libri Publishing.

Dugdale, S. (2009). Space strategies for the new learning landscape. Educause Review, 44(2). Online at: http://er.educause.edu/~/media/files/article-downloads/erm0925.pdf

Duguid, P. (2005). The art of knowing: social and tacit dimensions of knowledge and the limits of the community of practice. The Information Society, 21(2), pp. 109–118.

Elstad, E. (2016). Educational technology and polycontextual bridging. Rotterdam: Sense Publishers.

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. British Journal of Educational Psychology, 70, 113 – 136.

Evans, C., Muijs, D. & Tomlinson, M. (2015). Engaged student learning: high-impact strategies to enhance student achievement. York: Higher Education Academy.

Falconer, L. (2011, November). Metaxis: the transition between worlds and the consequences for education. Presented at Innovative Research in Virtual Worlds. Online at: https://uwe-repository.worktribe.com/output/957720/metaxis-the-transition-between-worlds-and-the-consequences-for-education

Farias, I. & Wilkie, A. (2016). 'Studio studies: notes for a research programme'. In: Farias, I. & Wilkie, A., eds, "Studio studies: operations, topologies and displacements". Abingdon: Routledge.

Fawns, T. (2019). Post-digital education in design and practice. Post-digital Science and Education, 1, pp. 132–145. https://doi.org/10.1007/s42438-018-0021-8

Fenwick, T., Edwards, R. & Sawchuk, P. (2011). Emerging approaches to educational research: tracing the socio-material. New York, NY: Routledge.

Filipe, A., Renedo, A. & Marston, C. (2017). The co-production of what? Knowledge, values, and social relations in health care. PloS Biol 15(5): e2001403. https://doi.org/10.1371/journal.pbio.2001403

Gallagher, S. (2005). How the body shapes the mind. Oxford: OUP.

Garrison, D. R. & Anderson, T. (2003). E-Learning in the 21st century: a framework for research and practice. London & New York: RoutledgeFalmer.

Gee, J. P. (2003). What video games have to teach us about learning and literacy. New York: Palgrave/Macmillan.

Gee, J. P. (2005). 'Semiotic social spaces and affinity spaces'. In: David Barton & Karin Tusting, eds, "Beyond communities of practice: language power and social context." New York: Cambridge University Press.

Gibson, J. J. (1979/1986). The ecological approach to visual perception. Boston, MA: Houghton Miffin.

Giddens, A. (1984). The constitution of society: outline of the theory of structuration. Cambridge: Polity.

Gieri, R. D. & Moffat, B. (2003). Distributed cognition: where the cognitive and the social merge. Social Studies of Science, 33(2), pp. 1-10.

Gunawardena, C. (1995). Social presence theory and implications for interaction collaborative learning in computer conferences. International Journal of Educational Telecommunications, 1(2/3), pp. 147-166.

Halverson, C.A. (2002). Activity theory and distributed cognition: or what does CSCW need to DO with theories? Computer Supported Cooperative Work 11, pp. 243–267.

Harrop, D. & Turpin, B. (2013). A study exploring learners' informal learning space behaviours, attitudes, and preferences. New Review of Academic Librarianship, 19(1), pp. 58-77.

Hasanefendic, S., Birkholz, J.M., Horta, H. & van der Sijde, P. (2017). Individuals in action: bringing about innovation in higher education. European Journal of Higher Education, 7(2), pp. 101-119, DOI: 10.1080/21568235.2017.1296367

Hase, S. & Kenyon, C. (2013). Heutagogy fundamentals. In: S. Hase and C. Kenyon, eds., "Self-determined learning: heutagogy in action". London: Bloomsbury.

Heidegger, M. (1927/1996). Being and time. Albany: State University of New York Press.

Hennion, A. & Farias, I. (2016). For a sociology of maquettes: an interview with Antoine Hennion. In: Farias, I. & Wilkie, A., eds, "Studio studies: operations, topologies and displacements." Abingdon: Routledge. Pp. 73-89.

Herrington, J. & Parker, J. (2013). Emerging technologies as cognitive tools for authentic learning. British Journal of Educational Technology, 44(4), pp. 607—615. Doi:10.1111/bjet.12048

Hitch, D., Pépin, G. & Stagnitti, K. (2014). In the footsteps of Wilcock, part one: the evolution of doing, being, becoming, and belonging. Occupational Therapy in Health Care, 28(3), pp. 231—246, DOI: 10.3109/07380577.2014.898114

hooks, b. (2012). Writing beyond race: living theory and practice. New York: Routledge.

Humphreys, A. & Grayson, K. (2008). The intersecting roles of consumer and producer: a critical perspective on co-production, co-creation and prosumption. Sociology Compass, 2(3), pp. 963-980. DOI: 10.1111/j.1751-9020.2008.00112.x

Hutchins, E. (1995). Cognition in the wild. Cambridge, MA and London: MIT Press.

Jackson, N. J. (2008). The life-wide curriculum concept: a means of developing a more complete educational experience? Retrieved from http://lifewidecurriculum.pbwiki.com/A-more-complete-education

Jackson, N. (2016). 'Ecology of lifewide learning and personal development'. Paper to support Lifewide Education 'Exploring Creative Ecologies' #creativeHE collaborative online activity, July 2016.

Jackson, N. J. & Buining, F. (2010). Enriching problem-based learning through design thinking. In: Barrett, T. & Moore, S., eds, "New approaches to problem-based learning: revitalising your practice in higher education". London: Routledge pp. 269—293.

Johnson, D. W. & Johnson, R. T. (2009). An educational psychology success story: social interdependence theory and cooperative learning. Educational Researcher, 38(5), pp. 365—379. https://doi.org/10.3102/0013189X09339057

Jones, C. (2004). The conditions of learning in networks. In: L. Dirckinck–Holmfeld, B. Lindström, B. M. Svendsen & Ponti, M., eds., "Conditions for productive learning in networked learning environments." Aalborg: Aalborg University/Kaleidoscope. Online at: http://www.ell.aau.dk/index.php?id=60.

Jones, C. & Healing, G. (2010). Net generation students: agency and choice and the new technologies. Journal of Computer Assisted Learning, 26(5), pp. 344–356. https://doi.org/10.1111/j.1365-2729.2010.00370.x

Kolb, D.A. (1984). Experiential learning: experience as the source of learning and development. New Jersey: Prentice Hall.

Kuhn, T. S. (1962). The structure of scientific revolutions. Chicago, IL: University of Chicago Press.

Kukulska-Hulme, A. (2010). Mobile learning as a catalyst for change. Open Learning, 25(3), November 2010, pp. 181—185.

Latour, B. (2005). Reassembling the social: an introduction to Actor-Network-Theory. Oxford: Oxford UP.

Lavé, J., & Wenger, E. (1991). Situated learning: legitimate peripheral participation. Cambridge, Mass.: Cambridge University Press.

Leehman, R. & Conceocao, S. (2010). Creating a sense of presence in online teaching: how to be there for distance learners. San Francisco: Jossey-Bass.

Lefebvre, H. (1974/1991). The production of space. Oxford: Blackwell Publishing.

Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., Cook, J., Day, P., Eccesfield, N., Hamilton, T., & Robertson, J. (2011). Learner-generated contexts: a framework to support the effective use of technology for learning. In: M.J.W. Lee & C. McLoughlin "Web 2.0-based e-Learning: applying social informatics for tertiary teaching. Hershey: Information Science Reference, pp. 70-84.

Mann, S.J. (2001). Alternative perspectives on the student experience: alienation and engagement. Studies in Higher Education, 26(1), 7–19.

Mannarini, T., Rochira, A. & Talò, C. (2012). Identification processes and inter-community relationships affect sense of community. Journal of Community Psychology, 40, pp. 951–967.

Manzo, A.V. et al. (1992). Dialectical thinking: a generative approach to critical/creative thinking. ERIC, Online at: https://eric.ed.gov/?id=ED352632

Markauskaite, L. & Goodyear, P. (2016). Epistemic fluency and professional education: innovation, knowledgeable action and actionable knowledge. Dordrecht: Springer.

Marsick, V.J. & Watkins, K.E. (2001). Informal and incidental learning. New Directions for Adult and Continuing Education. 89, pp. 25—34.

Mathews, A. (2019). Design as a discipline for post-digital learning and teaching: bricolage and Actor-Network Theory. Post-digital Science and Education, 1, pp. 413–426. https://doi.org/10.1007/s42438-019-00036-z

Mclaughlan, R. & Lodge, J. (2019). Facilitating epistemic fluency through design thinking: a strategy for the broader application of studio pedagogy within higher education. Teaching in Higher Education, 24(1), pp.81—97.

McLoughlin, C. & Lee, M.J.W. (2008). The three P's of pedagogy for the networked society: personalization, participation, and productivity. International Journal of Teaching and Learning in Higher Education. 20(1), pp. 10—27.

McWilliam, E. & Dawson, S. (2008). Teaching for creativity: towards sustainable and replicable pedagogical practice. Higher Education, 56, pp. 633–643. https://doi.org/10.1007/s10734-008-9115-7

Middleton, A. (2018). Reimagining spaces for learning in higher education. Palgrave Learning & Teaching.

Middleton, A., ed. (2015). Smart learning: teaching and learning with smartphones and tablets in post compulsory education. Media-Enhanced Learning Special Interest Group & Sheffield Hallam University.

Monahan, T. (2002). Flexible space and built pedagogy: emerging IT embodiments. Inventio, 4(1), pp. 1—19. Online at: http://www.torinmonahan.com/papers/Inventio.html

Morris, H. & Warman, G. (2015). Using design thinking in higher education. EDUCAUSE Review. Online at: http://er.educause.edu/articles/2015/1/using-design-thinking-in-higher-education

Müller, M. & Schurr, C. (2016). Assemblage thinking and actor-network theory: conjunctions, disjunctions, cross-fertilisations. Transactions of the Institute of British Geographers, 41(3), pp. 217—229 https://doi.org/10.1111/tran.12117

NCIHE (National Committee of Inquiry into Higher Education) (1997). Higher education in the learning society. London: HMSO.

NEF (New Economics Foundation) (2008). Co-production: a manifesto for growing the core economy. Online at: https://b.3cdn.net/nefoundation/5abec531b2a775dc8d_qjm6bqzpt.pdf

NESTA (2015). Creativity vs robots: the creative economy and the future of employment. [report] Online at: https://www.nesta.org.uk/report/creativity-vs-robots/

Norman, D. (2013). The design of everyday things: revised and expanded edition. New York: Basic Books.

Oblinger, D., ed. (2006). Learning spaces. EDUCAUSE. Online at: https://www.educause.edu/ir/library/pdf/pub7102.pdf

Oldenburg, R. (1989). The great good place: cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day. New York: Paragon House.

Ollis, T. (2012). A critical pedagogy of embodied education. Basingstoke: Palgrave Macmillan.

Orlikowski, W. & Scott, S. (2008). Sociomateriality: challenging the separation of technology, work and organization. The Academy of Management Annals, 2, pp. 433–474.

O'Reilly, T. (2005). What is Web 2.0: design patterns and business models for the next generation of software. Online at: http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.htm

O'Rourke, V. & Baldwin, C. (2016). Student engagement in placemaking at an Australian university campus. Australian Planner, pp. 1-14.

Orr, S. (2010). Collaborating or fighting for marks? Students' experiences of group work assessment in the creative arts. Assessment & Evaluation in Higher Education, 35(3), pp. 301—313.

Orr, S., & Shreeve, A. (2016). Knowing, not knowing and the unknown. Ambiguity and the locus of knowledge and power in student–tutor relations. SRHE Annual Research Conference 7 – 9 December 2016.

Orr, S. & Shreeve, A. (2018). Art and design pedagogy in higher education: knowledge, values and ambiguity in the creative curriculum. Routledge Research in Higher Education.

Paletz, S., Miron-Spektor, E., & Spencer-Rodgers, J. (2015). Dialectical thinking and creativity from many perspectives: contradiction and tension. In: J. Spencer-Rodgers, K. Peng (Eds) 'Psychological and cultural foundations of dialectical thinking'. Oxford: Oxford University Press. DOI: 10.1093/oso/9780199348541.003.0009

Polanyi, M. (1967). The tacit dimension. London: Routledge & Kegan Paul.

Ramire, R., Mukherjee, M., Vezzoli, S., & MatusKramer, A. (2015). Scenarios as a scholarly methodology to produce 'interesting research'. Futures, 71, August 2015, pp. 70-87.

Reiss, J. & Sprenger, J. (2014). "Scientific objectivity". In: Edward N. Zalta (ed.).'The Stanford Encyclopedia of Philosophy', (Winter 2020 Edition). Online at: https://plato.stanford.edu/archives/win2020/entries/scientific-objectivity/

Richardson, W. & Mancabelli, R. (2011). Personal learning networks: using the power of connections to transform education. Bloomington, IN: Solution Tree Press.

Rogers, E.M. (1962/2003). Diffusion of innovations, 5th edition. New York: Free Press.

Rose, J. (2012). How to break free of our 19th century factory-model education system. The Atlantic. Online at: https://www.theatlantic.com/business/archive/2012/05/how-to-break-free-of-our-19th-century-factory-model-education-system/256881/

Ross, C. & Noble, M. (2020). Bundling co-operative higher education: towards a theory of co-operative learning. Journal of Co-operative Studies, 53 (3), Winter 2020, pp. 25—29.

Ross, C., Terras, M., Warwick, C. & Welsh, A. (2011). Enabled backchannel: conference Twitter use by digital humanists. Journal of Documentation, 67(2), pp. 214—237.

Rowe, P. (1987). Design thinking. Cambridge, MA: MIT Press.

Rule, A. (2006). Editorial: the components of authentic learning. Journal of Authentic Learning, 3 (1), pp. 1-10.

Ryberg, T., Buus, L., & Georgsen, M. (2012). Differences in understandings of networked learning theory: connectivity or collaboration? In: L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell, eds, "Exploring the theory, pedagogy and practice of networked learning", pp. 43—52. New York, NY: Springer New York. https://doi.org/10.1007/978-1-4614-0496-5

Savin-Baden, M. (2015). Rethinking learning in an age of digital fluency: is being digitally tethered a new learning nexus? London & New York: Routledge.

Savin-Baden, M. & Falconer, L. (2016). Learning at the interstices: locating practical philosophies for understanding physical/virtual inter-spaces. Interactive Learning Environments, 24:5, 991-1003, DOI: 10.1080/10494820.2015.1128212

Scannell, L. & Gifford, R. (2010). Defining place attachment: a tripartite organizing framework. Journal of Environmental Psychology, 30, pp. 1–10. doi:10.1016/j.jenvp.2009.09.006

Schön, D. A. (1987). Educating the reflective practitioner: toward a new design for teaching and learning in the professions. San Francisco: Jossey-Bass.

Scott-Webber, L. (2014). The perfect storm; education's immediate challenges. In: L. Scott-Webber, J. Branch, P. Bartholomew, & C. Nygaard, eds, "Learning space design in higher education". Farringdon: Libri Publishing, pp. 151—167.

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. Educational Researcher, 27(2), pp.4-13.

Shaffer, D. W. (2007). Learning in design. In: R. A. Lesh, J. J. Kaput, & E. Hamilton, eds, "Foundations for the future in mathematics education", pp. 99–126. Mahwah, NJ: Lawrence Erlbaum Associates.

Sharples, M. (2019). Practical pedagogy: 40 new ways to teach and learn. Abingdon: Routledge.

Shulman, L. S. (2005). Signature pedagogues in the professions. Daedalus; Summer 2005; pp. 134, 3.

Siemens, G. (2003). Learning ecology, communities, and networks: extending the classroom. Online at: http://www.elearnspace.org/Articles/learning_communities.htm

Siemens, G. (2005). Connectivism: a learning theory for the digital age. International Journal of Instructional Technology and Distance Learning, 2(10), pp. 3–10.

Siemens, G. (2008). New structures and spaces of learning: the systemic impact of connective knowledge, connectivism, and networked learning. Online at: http://elearnspace.org/ Articles/systemic_impact.htm

Short, J., Williams, E., & Christie, B. (1976). The social psychology of telecommunications. London: John Wiley & Sons.

Sinclair, C. & Hayes, S. (2019). Between the post and the com-post: examining the post-digital 'work' of a prefix. Post-digital Science and Education (2019) 1, pp. 119–131. https://doi.org/10.1007/s42438-018-0017-4

Smirnov, N., Easterday, M.W. & Gerber, E. M. (2017). Infrastructuring distributed studio networks: a case study and design principles. Journal of the Learning Sciences. DOI: 10.1080/10508406.2017.1409119

St. Pierre, E. A. (2011). Post qualitative research: the critique and the coming after. In: N. Denzin & Y. Lincoln, eds., "The SAGE handbook of qualitative research, 4th ed.", pp. 611–625. Thousand Oaks, CA: Sage.

Stirzaker, R., Biggs, H., Roux, D. et al. (2010). Requisite simplicities to help negotiate complex problems. Ambio, 39, pp. 600–607. https://doi.org/10.1007/s13280-010-0075-7

Strickland, A. (2014). The active agency of a learning spaces. In: L. Scott-Webber, John Branch, Paul Bartholomew, & Claus Nygaard, eds, "Learning space design in higher education". Faringdon: Libri Publishing, pp. 209-223.

Sullivan, W. M. & Roisin, M. S. (2008). A new agenda for higher education: shaping a life of the mind for practice. San Francisco: Jossey-Bass.

Sung, E. & Mayer, R.E. (2012). Five facets of social presence in online distance education. Computers in Human Behavior, 28(5), pp. 1738—47.

Thomas, D. (2016). Placemaking: an urban design methodology. New York: Routledge

Tomlinson, M. (2017). Forms of graduate capital and their relationship to graduate employability. Education + Training, 59(4), pp.338-352. https://doi.org/10.1108/ET-05-2016-0090

Trowler, P. (2014). Disciplines and interdisciplinarity: conceptual groundwork. In: P. Trowler, M. Saunders & V. Bamber, eds, "Tribes and territories in the 21st Century: rethinking the significance of disciplines in higher education". London: Routledge.

Twigger-Ross, C.L., Bonaiuto, M. & Breakwell, G. (2003). Identity theories and environmental psychology. In: M. Bonnes, T. Lee, M. Bonaiuto, eds, "Psychological theories for environmental issues", pp. 203—233. Aldershot: Ashgate Publishing Limited.

Tuan, Y-F. (1977). Space and place: the perspective of experience. Minneapolis & London: University of Minnesota Press.

Turner, V. (1974) Dramas, fields and metaphors. Ithaca, NY: Cornell University Press.

UK Government (2019). Realising the potential of technology in education: a strategy for education providers and the technology industry. Department for Education. Online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791931/DfE-Education_Technology_Strategy.pdf

Usher, R. (2009). Experience, pedagogy, and social practices. In: K. Illeris, ed., "Contemporary theories of learning: learning theorists... in their own words", London & New York: Routledge, pp. 169 – 183

Weller, M. (2011). The digital scholar: how technology is transforming scholarly practice. London: Bloomsbury Academic.

Wenger, E., McDermott, R. & Snyder, W. M. (2002). Cultivating communities of practice. Cambridge, MA: Harvard Business School Press.

Wilcock, A. (1999). Reflections on doing, being and becoming. Australian Occupational Therapy Journal, 46(1), pp. 1—11.

Withagen, R., Araujo, D., & de Poel, H. J. (2017). Inviting affordances and agency. New Ideas in Psychology, 45, April 2017, pp. 11—18.

WEF (World Economic Forum) (2016). The future of jobs. [report, 18 January 2016]. Online at: https://www.weforum.org/reports/the-future-of-jobs

Wyckoff, M. A. (2014). Definition of placemaking: four different types. Planning & Zoning News. Online: http://pznews.net/media/13f25a9fff4cf18ffff8419ffaf2815.pdf

Zepke, N. & Leach, L. (2010). Improving student engagement: ten proposals for action. Active Learning in Higher Education, 11(3), pp. 167—177.

Section 2: Abstracts and Publications

This section of the document contains copies of all the publications used in the thesis:

The situated agency of studio learning and its value for non-studio disciplines

Andrew Middleton

A thesis submitted in partial fulfilment of the requirements of Sheffield Hallam University for the degree of Doctor of Philosophy

A note on the organisation of this section

A cover sheet including an abstract introduces each publication establishing its context in relation to the PhD thesis. A blank page has been inserted between the cover sheet and the publication to which it refers.

Citations for the articles accompany the article as published originally. Citations for the book chapters are aggregated in the selected bibliography at the end of this document.

Beyond podcasting: creative approaches to designing educational audio [A1]

Cover sheet and article abstract

Citation:
Middleton, A. (2009). Beyond podcasting: creative approaches to designing educational audio. Research in Learning Technology, 17(2). https://doi.org/10.3402/rlt.v17i2.10871

This first paper considers how digital audio can be used by academics to create a rich learning environment that draws upon audio's spatial affordances for personalising learning rather than its technical properties. Spatially, audio can disrupt traditional teacher-centred designs by accommodating participant voices in ways that contribute to creating a sense of communal presence.

However, the shift of focus to the actants and accommodating their agency inherently questions their readiness and motivation to engage within this open-ended learning space. For example, barriers are evident in the technocentric and teacher-centred accounts of 'coursecasting' in the research literature and in the beliefs that students in the 'Google Generation' are inherently digitally literate.

The research aims to contribute to the disruption of pedagogic intransigence by highlighting audio's spatial affordances for engaging students in their learning. It addresses the theme of disrupting traditional bounded spaces by providing examples of how an audio space affords "new and emerging learner-centred pedagogies [to enable] approaches that have, until now, not been realistically accessible."

These examples, developed by the academics in the *Closer!* pilot, also exemplify the theme of active and authentic learning. Authentic activity was most evident in methods which involved students as producers and agents of their own learning. Learner motivation and agency were central to the pedagogic rationale of academics in *Closer!*, however the idea of co-operative learning network was not a strong theme in this study beyond "softening some of the more formal, hard edges" in the VLE. Nevertheless, the idea of an audio-enhanced learning environment begins to emerge in this study as a place of being and co-operation through ideas about learning voice.

The paper concludes that audio can be understood as a viable and adaptable learning space for engaging students through diverse forms of pedagogic media intervention.

[295]

Abstract

This paper discusses a university-wide pilot designed to encourage academics to creatively explore learner-centred applications for digital audio. Participation in the pilot was diverse in terms of technical competence, confidence and contextual requirements and there was little prior experience of working with digital audio. Many innovative approaches were taken to using audio in a blended context including student-generated vox pops, audio feedback models, audio conversations and task-setting. A podcast was central to the pilot itself, providing a common space for the 25 participants, who were also supported by materials in several other formats. An analysis of podcast interviews involving pilot participants provided the data informing this case study. This paper concludes that audio has the potential to promote academic creativity in engaging students through media intervention. However, institutional scalability is dependent upon the availability of suitable timely support mechanisms that can address the lack of technical confidence evident in many staff. If that is in place, audio can be widely adopted by anyone seeking to add a new layer of presence and connectivity through the use of voice.

Introduction

Podcasting has only a limited value to education when it is understood from a simple technical perspective. For example, Deal (2007, 2) describes podcasting as “a means of publishing audio and video content on the web as a series of episodes with a common theme … accompanied by a file called a ‘feed’ that allows listeners to subscribe to the series and receive new episodes automatically”. However, when it is understood more broadly, driven by pedagogic requirements, a new, rich vein of educational applications for digital media emerges. Though only some of these may draw upon all of the technical

characteristics of podcasting, many applications emerge for the use of voice in ways that can enrich the virtual learning environment (VLE).

This paper describes how academic staff responded to the installation of a VLE podcasting tool (Podcast LX) and the running of the Closer! pilot at Sheffield Hallam University, which was initiated to promote learner-centred approaches to a blended curriculum. Academics were asked to think beyond the connections that can be made between new technology and existing pedagogy to consider what new practice was afforded by podcasting. Proposals from the 25 self-selected academics showed a desire to make the VLE a more human space through the greater use of voice. This was reflected in the name of the year-long pilot itself – 'Closer!'

This human concern contrasts with technical descriptions of educational podcasting, which often emphasise how the XML feed can enhance user access, and how it supports the serialisation of commonly themed content.

This paper reports on how a range of staff chose to enhance their practice with digital audio in the pilot.

Background

Podcasting is a technical term that describes the automatic distribution of asynchronous digital media to niche groups of subscribers using an RSS feed (RSS Advisory Board 2005). As such, it does not have any inherent educational value (Deal 2007). However, the capacity to capture and share learning voices, the flexibility it affords in providing access to media, its methods of production and its means of targeted distribution, do offer new opportunities to educators.

Disappointingly, the term is synonymous in some quarters with the transmission of the teacher's knowledge through the distribution of recorded lectures. A number of studies have attempted to evaluate podcasting, understanding podcasting in this simple way (e.g. Abt & Barry, 2007; Lazzari, 2009). Such studies assume that podcasting's value lies in its capacity to reproduce existing teacher-centred models through 'coursecasting' – the practice of recording and distributing lectures (Jones, 2006; Kadel, 2006). It should be noted that coursecasting has some benefits (Brittain *et al.,* 2006): obviating the need for students to take notes in class resulting in more attention

being paid to the teacher; providing the lecture for those who did not attend; providing a record to support revision (Evans, 2008).

The availability of proprietary lecture recording tools and the development of *iTunes U* (Apple Education, 2008) might imply that teaching can be commoditised as an educational experience in which listening equates to learning, but this notion is challenged by Draper and Maguire (2007, p. 51) and others who recognise that lectures exist for "a particular group of learners, at a particular moment" and resist the suggestion that they can be "canned" for posterity. Coursecasting conflicts with progressive and increasingly dominant learning theories such as Social Constructivism (Vygotsky, 1978), Communal Constructivism (Holmes *et al.*, 2001) and Connectivism (Siemens, 2005), which advocate richer, active learning experiences for learners, where learners are encouraged to arrive at personal understandings within a social context.

Podcasting is much more complex than coursecasting evaluation studies might suggest. As with any learning technology, its application is inevitably determined by many local factors that make the transferability of findings difficult (Kirkwood, 2003) and some of the contexts that may affect the implementation of podcasting include: profile and size of student user groups; technical competence and confidence of all stakeholders; the intricacies of the institutional technical infrastructure and associated policies; teaching philosophies; professional philosophies; academic style; positioning of the resource in the pedagogy; learner awareness, motivation and preferences.

At the same time, and despite some of the initial interest in podcasting's mobile interface to learning (Campbell, 2005), the use of the term is increasingly simplified to mean the online distribution of any asynchronous digital media, not just media distributed through RSS podcast feeds (Ralph *et al.*, 2008). For example, France and Ribchester (2008) describe their use of personalised audio feedback as podcasting. Even where there is a feed, students tend to access podcasts directly from course sites using a PC, rather than via a feed or by using mobile devices (Malan, 2007; Newnham & Miller, 2007), whilst Aliotta *et al.* (2008) describe delivering podcasts during face-to-face teaching sessions.

In exploring the educational potential of podcasting we cannot assume that students want to learn with podcasting simply because they belong to the 'Google Generation' (CIBER 2008, p. 5). Undoubtedly, some students own devices capable of managing podcast subscriptions, but if they are aware of the technical processes at all, they often perceive it as an advanced technology and one that they do not associate with studying or with the use of their personal equipment (Cann, 2007; Lee & Chan, 2007).

However, the proliferation of MP3 players and the frequent mention of *iPods* and podcasting in the popular media have been useful in raising awareness of digital media amongst academics, perhaps suggesting that it is becoming reliable, enjoyable and engaging for users (Campbell, 2005). Similarly, and importantly, the popularity of user-generated video websites like *YouTube*, suggest that digital media is no longer the preserve of media technicians (Cann, 2007).

Many authors (e.g. Aliotta *et al.* 2008; Cane & Cashmore, 2008; Chan & Lee, 2005; Draper & Maguire, 2007; Lazzari, 2009; Stewart & Doolan, 2008) have shown that digital media technology can have myriad engaging and active learning applications. This variety reflects the variety of challenges and interests facing the teachers and students who have explored it.

Other commentators suggest podcasts are best when they: are brief (Chan & Lee, 2005); allow academics to offer pre-vision and re-vision materials to lectures (Aliotta *et al.*, 2008; Nortcliffe & Middleton, 2008); are used to summarise knowledge (Cane & Cashmore, 2008; Evans, 2008; Ralph *et al.*, 2008), especially when it is the students who are producing the summaries (Draper & Maguire, 2007).

The initiative discussed here, however, was informed by the belief that new and emerging technologies should be explored to enable new and emerging learner-centred pedagogies, enabling approaches that have, until now, not been realistically accessible. Learner-centredness describes pedagogy that places "student responsibility and activity at its heart, in contrast to a strong emphasis on teacher control and coverage of academic content in much conventional, didactic teaching" (Cannon & Newble, 2000, p. 16). Others have recognised the

opportunity to incorporate audio as a component in this learning mix: Lee, McLoughlin and Chan (2007) consider how audio can be used as a catalyst in mediating knowledge creation where learners have been involved in generating digital audio learning objects (DALOs); Stewart and Doolan (2008) continue to explore how audio can be used to promote self-reflection and collaborative learning.

The *Closer!* pilot is part of an ongoing exploration of digital audio-enhanced pedagogy. The DALO concept (Middleton & McCarter, 2005; Lee, McLoughlin, & Chan, 2007) proposes that the collaborative design of short audio learning objects can provide a valuable learning focus.

Similarly the concept of media intervention (Middleton 2008; Middleton & Mather, 2008) suggests that digital media should be considered, not as a didactic tool, but as a simple catalyst to promote learner activity, setting challenges, seeding ideas, illustrating problems or 'getting students in the zone'.

Establishing the pilot

The *Closer!* pilot was managed from a central educational development unit, its name emphasising how the virtual proximity of learning voices offers a new sense of presence to the VLE.

Educational podcasting awareness workshops were run for academics in each faculty and the main characteristics of the technology were highlighted. The workshops emphasised the many ways in which podcasting can support learning, where students can be either users or producers of the media. Ideas for creative educational podcasting were discussed. Subsequently, 25 workshop participants joined the one-year pilot on a voluntary basis. The aim of the pilot was to encourage academic innovation in the use of digital media to enhance learning, teaching and assessment.

All but one set of participants set out to use audio in the pilot, with a team from Nursing exploring the potential of video podcasts for a clinical skills module.

A community site was established in the VLE for pilot participants. This linked to a collection of support materials targeted at staff and students. These

included PDF guidance documents, media design templates, demonstration screencasts and an extensive FAQ (Frequently Asked Questions) collection. They covered the practicalities of working with audio hardware, software and the *Podcast LX* tool; the pedagogic flexibility offered by the technology; and presented visualisations of the processes.

Specific workshops about using the technology were *not* run prior to the pilot; the awareness workshops had demonstrated the accessibility of the technology. However, institutional and faculty-based support teams were alerted to expect requests for help and equipment.

A series of weekly 'Idea Announcements' were posted to the VLE intended to inspire the participants initially, and latterly to provide ideas for future development. These ideas (see Table 1) were kept brief and open-ended with participants being encouraged to adapt them to suit their needs.

The pilot's podcast was designed as a communal constructivist device (Holmes *et al.*, 2001) and could be accessed directly through *Blackboard* or via a feed. It also modelled a relaxed semi-formal style, realistic production values and an example of how episodes could be embedded within the VLE using the *Podcast LX* tool. Editing was kept to a minimum, exemplifying the light touch approach to sustainable educational production. 'Show notes' accompanying each interview provided a listening menu, indicating the timing of various themes in the conversation making navigation of the recordings easier. Audio messages were occasionally distributed via the podcast informing participants of events, reminding them of support and inviting them to come forward for interview.

The pilot presented a research opportunity to explore the versatility of audio as an educational medium as evidenced in the methods devised by academics in their many contexts. Given the interest and willingness of pilot participants to look beyond coursecasting and other teacher-centred approaches, the following research question was used to frame the investigation:

How did academic staff in a UK university apply their emerging understanding of educational podcasting as a medium to engage their students?

Research methodology

Pilot participants were encouraged to report back after about two months to the pilot community through interviews for the Closer! podcast. Participants had the opportunity to meet in person at the outset of the project in the workshops and drop-in support sessions, but otherwise did not meet as a project group. Nine of the 25 participants volunteered to share their experience, in turn, over a period of eight weeks. Of the others, some were not available, some were reticent to talk about their progress publicly and the remainder did not begin podcasting until the second semester.

The research draws upon these nine semi-structured interviews. The interview process provided participants with a timely opportunity for reflection, as well as with an opportunity to inform the plans of other participants preparing for second semester modules. The research methods used were intended to directly affect the design of podcast applications in the ongoing pilot, as well as informing the research. The approach is typical of action research methodology, with the research intervention not only informing and affecting listening participants, but the interviewees too. As such, the method is "a socially engaged approach to knowledge generation … adopt[ing] a dynamic, cyclical process which moves through phases of planning, action, observation and reflection" (Bloor & Wood, 2006, p. 10). As with other action research methods, the intention was that the community of participants would be empowered through its collaborative involvement (Cohen, Manion & Morrison, 2000, p. 79).

The interviews were conducted and analysed by the author, who also managed the pilot. However, the data should be understood primarily as artefacts of pilot activity and not as post hoc participant reflection upon it.

Table 1. Examples of idea announcements for educational podcasting from the Closer! Pilot VLE.

Audio Glossary	A glossary of complex ideas or jargon, created by students and/or tutors
Professional briefings	Getting professionals into the University can be difficult to organise, however asking someone out in the 'real world'

	to brief your student assignment can set an authentic, professional tone. It can be a lot easier to organise an audio recording. There are several options, and some make it easy for them to stay involved with the assignment along the way: ask them to record audio briefings from their office; use internet telephony to make recordings; or invite them in and use an MP3 recorder in your office to record their message.
Newscasting	Broadcast news programmes, and the various techniques they use (e.g. "…And Finally") offer a good framework for student podcasts because they consider various perspectives and should be non-judgemental. Students and their audience will be familiar with the genre and so producers have useful reference points when beginning to plan what they will do. When setting a student podcast, therefore, consider telling your students, "Do it in the style of a 2 minute news bulletin that incorporates at least two contrasting perspectives."
Field Assignments	Listening to or making podcasts can be done anywhere given the portable devices and services we can access. If you and/or your students are going off-campus, capture the intensity and richness of the trip on audio: interviews with people you encounter; data collection; reflective discussions on location; observation; sound stories.

The questions used to frame the interviews were:

(2) What do/did you hope to achieve?
(3) What ideas have you had?
(4) What have you actually done?
(5) How have you and your students managed?
(6) What have been the important characteristics of the technology for you?

The interviews were transcribed and analysed by the author. The transcripts were coded according to the questions and six themes emerged:

(1) The value of the RSS feed in the academic context;
(2) Podcasting and pedagogic change;
(3) Media intervention;
(4) Scalability;
(5) Technical competence and confidence;
(6) Tutor strategies for implementing podcasting.

Each theme was evident in most interviews, though not necessarily common to all.

Project stories and emerging themes

Outline descriptions of nine project stories from the *Closer!* pilot are presented in Table 2.

The value of the RSS feed in the academic context

The topic of the podcast feed was not discussed by everyone. Those who did discuss it reported that they did not push it. "I only did that part of it for me to make sure that I could do it". (S2) The consensus was that:

> *They're going to the VLE. They want to listen to the audio while they're doing their work. So subscribing to the podcast is meaningless to them as they want it while they're working. (S4)*

One academic (S3) cautioned that it is not appropriate to use these technologies unless the students:

> *… can see clearly that it's got a real purpose … What they're saying to me is, "Our time isn't limitless either … If there's a benefit we'll go with you and we'll do it". I suppose we haven't got to that level of thinking about it really. Our longer term aim is to make the Blackboard sites more alive.*

Podcasting and pedagogic change

In Nursing (S1) the existing classroom practice was proving difficult to scale with increasingly large cohorts. Video learning objects were introduced to allow

students to review techniques and develop their confidence before going onto the hospital wards, “where this is happening to a real patient”. The tutors were also interested in extending the learning environment through the use of portable devices into the students’ hospital practice.

Table 2. Closer! pilot project stories.

Story 1 (S1)	Nursing staff and students produced video learning objects about clinical techniques, supporting the transition of placement students from the safety of the clinical skills classroom to ward-based practice.
Story 2 (S2)	Sport student groups produced DALOs on key topics based upon a research activity initially written up in group wikis. Students then independently critically reviewed all of the audio objects in the shared module resource and fed back to peers. The module tutor set out to encourage the social construction, synthesis, and self-assessment of knowledge. He later provided audio feedback to the cohort on the assignment.
Story 3 (S3)	In Business several approaches were used including: the setting of a weekly activity using audio announcements; the student submission of audio sources from relevant global podcasts to add to the module feed; episodes about placement preparation edited by the tutor from interviews with students on international placement. The tutor’s intention was to raise engagement by making the presentation of material on the Blackboard site more interesting and to make connections to the outside world.
Story 4 (S4)	The Software Engineering tutor took an audio scaffolding approach with ongoing audio feedback for students working through the process of applying for jobs. Feedback notes given in weekly classes on common areas of weakness were recorded and redistributed

	through the VLE. The audio provision was intended to add impact to the feedback messages and ensure that the students could access tutor advice in a timely way whenever they returned to the task.
Story 5 (S5)	In Art & Design semi-structured conversations were recorded on the “questions you’re afraid to ask.” These were initially targeted at students with dyslexia. Episodes featured discussions on topics such as, “What is a quote?”, “What is academic writing?”, “What’s the difference between qualitative and quantitative research?” so addressing fundamental questions that students rarely ask, but should.
Story 6 (S6)	In Computing two approaches were used: Students submitted links to audio podcasts published elsewhere; students were offered podcast production as a presentation option on a research assignment as an alternative to an essay or a face-to-face presentation. In both cases the intention was to inform discussion about, and subsequently affect, the presentation of their own module.
Story 7 (S7)	In Journalism there were two student podcasting assignments. Students were required to work independently carrying out vox pops (“an essential journalism technique”) with a range of people on the topic, “What makes a good student?” Later, groups were asked to create a short feature on why you should study Journalism at the university as a marketing device. These techniques were intended to replace an existing study skills module with a more authentic pedagogy.
Story 8* (S8)	In Communications the intention was to develop an audio library of short, reusable, impromptu responses to questions submitted by post-graduate students on a

	distance learning course. This library was intended to break down their sense of isolation by introducing voice to the VLE.
Story 9* (S9)	A Health Policy podcast featuring the voices of global experts was seen to be valuable for many in the Health faculty as it offered flexible access to different inter-professional perspectives.

*Stories 8 and 9 had not produced their podcasts at the time of the interviews.

In Sport (S2) student-generated group audio pieces replaced group presentations. The tutor's intention was to raise student motivation by creating a sense of responsibility amongst student groups who were charged with developing a common module repository. Creating a sense of student purpose was a driver in S3 too where the academic noted that:

> *Trying to get some of the students to engage and do the work in the group discussions – a lot of it falls flat. And it's difficult then. Sometimes it's like trying to get blood out of a stone. But they like doing things.*

The Software Engineering tutor (S4) was keen to pursue the use of audio to aid reflective practice. As a result of her own use of audio she intends to, "throw responsibility back at the students to record reflective logs of their lab work".

The approach taken in Journalism radically changed the study skills module from a key module that was not enjoyed by either staff or students, to one where students became actively engaged in a more authentic activity that brought key skills right back into focus.

Media intervention

The media intervention concept proposes that learning with media can initiate and facilitate learning. The Sports tutor valued the role that media could play when used simply:

It was about the 'students as producers' thing, it is by actually doing this. That is where the learning comes.

In Software Engineering the immediacy of the medium was appreciated. Timely interventions through broadcast audio feedback kept the students on track whenever they were ready to re-engage with the ongoing task through the reiteration of key points. The immediacy and currency of digital media was also appreciated in Nursing (S1) where the notion of expertise "changes regularly".

Again, the timeliness provided by asynchronous digital media allowed students to engage with the Art & Design audio conversations (S5):

Often you don't need that material until you're at the point of needing it.

Intervention by voice was an attractive option to the Business tutor who valued the new opportunity to engage students more personally in the VLE. She wanted to:

… bring in the voice element to try and engage the students to try and make them do activities in preparation for say their tutorial, but also as a way of us being able to update the materials as different things happen and occur in the outside world. It's a friendlier atmosphere because there's somebody talking to them rather than just a cold text. (S3)

In Computing (S6) the tutor reported that media resulted in a deeper engagement:

They'd not only found audio pieces but other stuff that was supportive, such as screencasts. This got a bit of discussion going on the discussion board.

Scalability

The pilot was, in part, interested in the scalability of the user production of media. Expectations for high quality, broadcast standard production were challenged. An important message in the workshops, concerning production values, had been, "We are not the BBC, we are academics and students".

Despite this several participants did not want to appear ‘too amateurish’. “If it’s not of a good quality students are not going to respect this”, one explained. However, others recognised that they were not interested in the production quality of student work:

> *I made it clear that I wasn’t marking on the quality of the product but that what I was looking for was a variety of responses and a variety of voices. (S7)*

The danger is that expectations for high quality from either staff or students will impede production and scalability.

The assessing of student work impacts on the scalability of audio models. Reviewing 60 pieces of student work, even when they only last 45 seconds each, is a significant task:

> *I lost the will to live at one point! I think we asked for 45 seconds for the first piece and a couple of minutes for the group piece because I felt the group piece should have a bit more work in it. I think 45 seconds was just about right. (S6)*

Peer review is one approach that works as long as expectations and guidance are clear: “I think the methodology I was using could be transferred to any topic” (S2).

In student-producer models, such as (S7), scalability is affected by the access to equipment and most importantly by the confidence of each student in using it. This connects directly to a fifth theme.

Technical competence and confidence

Several of the respondents noted that there was a small initial technology hurdle to overcome, but that podcasting could be “picked up very quickly” (S1). Similarly the Computing tutor noted:

> *I could go to Audacity [recording software] and I could record very easily and quickly – probably quicker than drafting it out in text … I think it’s a confidence thing with the more you try and do things like this the easier it becomes to just do it. I think if you think*

about it too much and plan it out and script it, that can sometimes make it a little more difficult than just going for it.

This illustrates the tutor's confidence with technology and an existing strategy for developing new skills. However, most participants had not produced digital media before and the technology hurdle was significant for them. Many were nervous, became frustrated or did not have a personal strategy for learning to use new technology. In some cases they avoided it altogether. Even where they were expecting students to be the producers, they felt that they needed to be fully conversant with the technology. The Journalism tutor (S7) reported that she "felt very frustrated in that students were coming to me with questions that I wasn't able to answer immediately".

Many of the tutors were deterred from taking part at all. Some reported that they had other pressures that prevented them from staying involved in the pilot:

When it came to do it I didn't know enough about podcasting myself and I felt I needed to develop the skills to support students, because I couldn't really expect them to do this if I wasn't sufficiently comfortable with the technology myself. So in the end I didn't do it … I would have to do them at home and my computer is a bit ancient, so I didn't really want to try this. (S8)

Even though there was an abundance of support material in various formats available to participants, the interviews revealed that many of the academics expected to become fluent in using the various technologies and that this would require more personal support and time:

I just want more time to learn the technology. The barriers to doing more are having the time to learn and become fully confident with the technology. (S5)

Expectations of developing professional technical skills and aspiration to professional production values resulted in over-planning in at least one case (S9). This ambition resulted in an insurmountable obstacle:

We invited people to a meeting and set up a Blackboard site and the idea was that through the Blackboard site that we'd have a

series of discussions and the podcasts would be part of that. Frankly, since we did that it started well, but we have become extremely busy.

There was a lack of competence and confidence amongst students too. Most students are not conversant with digital media production:

I'd also assumed that the students would be more technically skilled than I am and that's not necessarily the case. And that they would be more confident around technology than I am and in practice, God help them, they're even worse off than I am. (S7)

One academic (S8) realised that her distant students would be preoccupied in the first semester module with learning how to use university facilities remotely and that she needed to make their learning more manageable:

Looking at podcasting in the second module might be better, [to avoid] overloading the students.

Tutor strategies for implementing podcasting

Despite the hurdles encountered by some academics, most were eventually successful in seeing their ideas through by employing various strategies:

We put ourselves under pressure, but that made it happen. (S1)
My strategy for getting through was making the mistake of putting it on the module guide that we were going to do it! (S7)

I spoke to a colleague who is more au fait with those sorts of things than I am and he delivered a couple of sessions on using Audacity … I sat in with the students and was able to do [the activities] reasonably competently. (S7)

There was little evidence that the support materials had been used:

I don't want a manual that I've got to work through … I'm like that about a lot of the digital changes that are happening. (S5)

Unless you look at things before the teaching starts, it's very much a hand-to-mouth existence. I just don't get the time to go through things as much as I'd like. (S7)

Amongst the staff interviewed, those who did not succeed initially with the technology stayed motivated and subsequently found colleagues to help them learn or attended training. The Communications lecturer, who had not succeeded during the pilot, subsequently reported back to others via the pilot podcast on an audio skills workshop she had attended through a recording she made independently.

Conclusion

This paper has considered the versatility of audio as an educational medium through the experience of academic staff in a pilot initiative. The research aimed to discover how academic staff applied their understanding of educational podcasting as a medium to engage their students. A review of the literature and the experience of staff in the *Closer!* pilot has resulted in several conclusions.

Though the use of the term podcasting by the media and the availability of suitable tools in the institutional VLE have led to greater interest amongst some academics, the RSS model of distribution is not regarded as useful by most academics. Instead, staff expected their students to come to the VLE to use the media.

Academics in the pilot enjoyed the opportunity to creatively consider how audio could be used to enhance their teaching. Audio provided them with a mechanism to move towards learner-centred pedagogies, often in ways that positioned media as a catalyst in encouraging student activity.

Audio also demonstrated a capacity to facilitate authentic engagement, allowing students to connect in various ways to the outside world, both as listeners and publishers. The ease and speed with which digital audio can be deployed was used to support timely interventions and in some cases promoted information currency and responsiveness.

However, the project stories show that academics can be held back by several factors, even when podcasting is subsequently found to be relatively simple to do. These include ongoing commitments, a lack of technical learning strategy and a lack of confidence in using unfamiliar media technology. There was a tangible sense of risk in the pilot that deterred some from participating. It is critical, therefore, that support in using digital media is available for some

academics whenever the need occurs, though this need not be extensive or protracted. The institutional scalability of educational podcasting will be hindered where technical confidence is lacking. Peer mentoring, amongst staff or students, can help. However, it was also noticed that confidence is developed through quick and simple successes given that unfamiliarity is the major hurdle to overcome.

It appears that there is a diverse range of confidence amongst students too; it would be wrong to assume their prior experience with, or interest in, digital media or its production. Nevertheless, student podcast production offered an engaging exercise where it was used.

Assessment of time-based media products can be time consuming. Peer assessment can help and the assessment of the student learning *process* can be more useful and realistic than assessment of their products.

Findings from the pilot and related digital media initiatives have resulted in an evaluation of the institution's infrastructural capacity to support digital media-based pedagogy. Low risk methods designed to familiarise staff with using digital media have been devised, providing subject teams with the opportunity to touch and discuss the technology.

Historically digital media may have been the preserve of the learning technologist, but evidence from the pilot and initiatives elsewhere indicates that audio, if introduced with care, can be widely adopted across the curriculum.

The use of voice in the VLE is softening some of the more formal, hard edges created by the dominance of text-based materials so far, bringing a sense of personal presence and connectivity to the space. Pedagogic innovation involving audio will continue to contribute to the VLE becoming a more vibrant and diverse learning space.

References

Abt, G., and T. Barry. 2007. The quantitative effect of students using podcasts in a first year undergraduate exercise physiology module. *Bioscience Education e-Journal* 10: 8–10.

Aliotta, M., S. Bates, K. Brunton, and A. Stevens. 2008. Podcasts and lectures. In *Podcasting for learning in universities,* ed. G. Salmon and P. Edirisingha, 33–42. Milton Keynes, UK: Open University Press.

Apple Education. 2008. *iTunes U and mobile learning.* Apple website. http://www.apple.com/education/itunesu_mobilelearning/itunesu.html

Bloor, M., and F. Wood. 2006. Keywords in qualitative methods: A vocabulary of research concepts. London: Sage.

Brittain, S., P. Glowacki, J. Van Ittersum, and L. Johnson. 2006. Podcasting lectures. *Educause Quarterly* 3: 24–31. Campbell, G. 2005. There's something in the air: Podcasting in education. *Educause Review* November/December: 32–46.

Cane, C., and A. Cashmore. 2008. Student-produced podcasts as learning tools. Paper presented at the Higher Education Academy's fourth Annual Conference July 1–3, at the Harrogate International Centre.

Cann, A.J. 2007. Podcasting is dead. Long live video! *Bioscience Education e-Journal* 10.

Cannon, R., and D. Newble. 2000. A guide to improving teaching methods: A handbook for teachers in university and colleges. London: Kogan Page.

Chan, A., and M.J.W. Lee. 2005. An MP3 a day keeps the worries away: Exploring the use of podcasting to address preconceptions and alleviate pre-class anxiety amongst undergraduate information technology students. In *Good practice in practice. Proceedings of the Student Experience Conference,* ed. D.H.R. Spennemann and L. Burr, 59–71. Wagga Wagga, NSW: Charles Sturt University.

CIBER. 2008. Information behaviour of the researcher of the future: CIBER briefing paper. http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf

Cohen, L., L. Manion, and K. Morrison. 2000. *Research methods in education.* 5th ed. London and New York: RoutledgeFalmer.

Deal, A. 2007. *Podcasting – a teaching with technology white paper.* Pittsburgh, PA: Carnegie Mellon University.

Draper, S.W., and J. Maguire. 2007. Exploring podcasting as part of campus-based teaching. *Practice and Evidence of Scholarship of Teaching and Learning in Higher Education.* 2, no. 1: 42–63.

Evans, C. 2008. The effectiveness of m-learning in the form of podcast revision lectures in HE. *Computers & Education* 50: 491–8.

France, D., and C. Ribchester. 2008. Podcasts and feedback. In *Podcasting for learning in universities,* ed. G. Salmon and P. Edirisingha, 33–42. Milton Keynes, UK: Open University Press.

Holmes, B., B. Tangney, A. FitzGibbon, T. Savage, and S. Meehan. 2001. Communal Constructivism: Students constructing learning for as well as with others. In *The proceedings of Society for Information Technology and Teacher Education International Conference 2001,* ed. C. Crawford, 3114–9. Chesapeake, VA: AACE.

Jones, D. 2006. Enhancing the learning journey for distance education students in an introductory programming course. Central Queensland University. http://cq-pan.cqu.edu.au/david-jones/Publications/Papers_and_Books/react1.pdf

Kadel, R. 2006. Coursecasting: The wave of the future? *Leading and Learning with Teachnology* 33, no. 5: 48–49. http://www.iste.org/Content/NavigationMenu/EducatorResources/YourLearningJourney/EnvisioningtheFutureofEducationandTechnology/Coursecasting_the_Wave_of_the_Future.pdf

Kirkwood, A. 2003. Understanding independent learners' use of media technologies. *Open Learning* 18: 155–75.

Lazzari, M. 2009. Creative use of podcasting in higher education and its effect on competitive agency. *Computers & Education* 52, no. 1: 27–34.

Lee, M., and A. Chan. 2007. Pervasive, lifestyle-integrated mobile learning for distance learners: An analysis and unexpected results from a podcasting study. *Open Learning: The Journal of Open and Distance Learning* 22, no. 3: 201–18.

Lee, M., C. McLoughlin, and A. Chan. 2007. Knowledge creation processes of students as producers of audio learning objects. In Beyond control: Learning technology for the social network generation. Research proceedings of the 14th Association for Learning Technology Conference, ed. S. Wheeler and N. Whitton, 116–28.

Malan, D. 2007. Podcasting computer science E-1. In Proceedings of SIGCSE'07, March 7–10, 2007, Covington, Kentucky, USA, 389–93.

Middleton, A. 2008. Audio feedback: Timely media interventions. In Proceedings of The Third International Blended Learning Conference, 'Enhancing the Student Experience', University of Hertfordshire, UK, Wednesday 18th–Thursday 19th June 2008, ed. H.J. Millar and A.L. Jeffries, 15–27.

Middleton, A., and R. Mather. 2008. Machinima interventions: Innovative approaches to immersive virtual world curriculum integration. *ALT-J Research in Learning Technology* 16, no. 3 (Special Issue: Learning and teaching in virtual worlds): 207–20.

Middleton, A., and R, McCarter. 2005. Engaging solutions: A collaborative approach to digital audio learning object (DALO) production. Workshop presented at ALT-C 2005, Manchester, UK, September 6–8. http://www.alt.ac.uk/altc2005/timetable/files/515/ Engaging%20solutions_v2.ppt

Newnham, L., and C. Miller. 2007. Student perceptions of podcasting to enhance learning and teaching in an information systems course. In *Beyond control: Learning technology for the social network generation. Research proceedings of the 14th Association for Learning Technology Conference,* ed. S. Wheeler and N. Whitton, 104–15.

Nortcliffe, A.L., and A. Middleton. 2008. Blending the engineer's learning environment through the use of audio. *Journal of the Higher Education Academy Engineering Subject Centre* 3, no. 2: 45–57.

Ralph, J., N. Head, S. Lightfoot, and E. Jubb. 2008. Pol-casting: The use of podcasting in the teaching and learning of Politics and International Relations. Paper presented at the Higher Education Academy's fourth Annual Conference, July 1–3, at the Harrogate International Centre.

RSS Advisory Board. 2005. Really Simple Syndication: RSS 2.0.10 Specification (revision published by the RSS Advisory Board on October 15, 2007). http://www.rssboard.org/ rss-2-0-1-rv-6

Siemens, G. 2005. Connectivism: A learning theory for a digital age. http://www.elearnspace. org/Articles/connectivism.htm

Stewart, W., and M.A. Doolan. 2008. Listen to this: Enhancing the learner experience through the use of audio within next generation technologies. Paper presented at the Higher Education Academy's fourth Annual Conference, July 1–3, at the Harrogate International Centre.

Vygotsky, L.S. 1978. *Mind in society.* Cambridge, MA: Harvard University Press.

Audio active: discovering mobile learner-gatherers from across the formal-informal continuum [A2]

Cover sheet and article abstract

Citation:
Middleton, A. (2011). Audio Active: Discovering Mobile Learner-Gatherers from Across the Formal-Informal Continuum. International Journal of Mobile and Blended Learning (IJMBL), 3(2), 31–42.
https://doi.org/10.4018/jmbl.2011040103.

The disruption of traditional bounded spaces through the affordances of mobile technology provides the context for this review of mobile learning scenarios. Mobility emphasises the agency of the 'learner gatherer' creating a place of being and enactment. The environment itself becomes a significant actant, creating a site of active and authentic learning.

Authenticity in this study is notable for its complexity, its real-world setting, the interaction it affords the learner, and its effect on the learner's identity and self-efficacy. Knowledge is unbound and removed from the abstract academic domain through the incorporation of personal technology and rich media, and the temporal and spatial shifts they afford. The scenarios describe knowledge as an outcome of discovery and application *in situ*, revealing their benefit for developing a student's sense of becoming and their employability identities.

The learner is portrayed as gatherer and producer immersed in authentic learning situations which contrast with, and reveal the weakness of, 'deadtime' transmission models of mobile learning. The ubiquity of the technology and the pervasive role of audio through its use and production, are described as mediating learning through the creation of multiple temporal layers and polycontextual realities. Pedagogically and cognitively, the implications of this are that mobile audio can promote reflection in, on and through action.

The concept of learner gatherer connects to liminality, learning ecologies and networks, and the sense that the student is both autonomous and part of something. The application of mobile audio promotes the personalisation of learning and enhances agency. It is pervasive and adaptable to changing circumstances and its use exposes new roles for the learner in the formal and non-formal places and spaces in which they experience lifewide learning and complete education (Jackson, 2008).

[284]

Abstract

This paper challenges the dominant perception evident in the literature that mobile podcasting is primarily a medium for knowledge transmission. It describes why and how mobile audio learning can be facilitative, active and integrated, and how it can involve diverse voices, including those of students, in ways that usefully disrupt didactic pedagogy. Audio is described as an active learning environment, capable of supporting connection to the real world around education in which students are able to act as autonomous learner-gatherers. The paper responds to concerns raised by Ciussi, Rosner, and Augier (2009) that some students are disinterested in podcasting and uses a scenario-based design methodology (Carroll, 2000) to describe and evaluate six innovative applications. It concludes that mobile audio can be understood as an active medium capable of richly and meaningfully engaging learners.

Introduction

Ciussi, Rosner, and Augier (2009) in their study of students' interest in using podcasting on their mobile devices identify two myths in the literature: firstly, those students who have grown up with the Internet are uncomfortable with, or unaware of, podcasting; secondly, that the much vaunted idea of "'learning anytime anywhere' is ...something of a myth" (Ciussi, Rosner, & Augier, 2009, p. 95). Importantly, they question whether these findings would be true in situations where podcasts are integrated into an active, learner-centred pedagogy. Building upon this, this paper presents a view of mobile educational audio that is designed to be learner-centred, active and integrated, and challenges approaches to educational podcasting that see it as a technical extension to existing learning environments, suited to information transmission.

This paper describes the use of educational audio in terms of its capacity to change modes of engagement across the formal-informal learning continuum, especially in ways that heighten activity, authenticity and learner-centredness. Ciussi et al. (2009) suggest that knowledge construction and

knowledge sharing offer two contexts for effective learning with mobile audio. This suggestion is explored using a scenario-based design methodology (Carroll, 2000), a method that allows the curriculum designer to imagine, describe and evaluate pedagogy.

Background

General academic access to digital audio production is relatively recent. Its use, therefore, should promote innovation, especially in addressing the needs and expectations of learners in the Digital Age, and society in general. Areas of audio innovation include the user-generation of content, the growing appreciation of mobile learning and exploration of less formal methods of learner engagement. These ideas are explored here to provide background to the evaluation of a set of six mobile audio scenarios.

Looking Back to the Future

Consideration of audio and podcasting by learners, teachers and their institutions is inevitably obscured by previous experiences of education. McLuhan and Fiore (1967, pp. 74-75) describe this problem with evaluating the potential of technology as looking “at the present through the rear-view mirror”; recognising that it can be difficult to think creatively beyond the paradigm that we know and expect.

‘Dead-time learning’ (Learn Out Loud, 2005) is a concept that seems to make sense to those interested in understanding the potential of educational audio: learning can be delivered at times that would otherwise be unproductive to the commuting or otherwise displaced student through the introduction of mobile technology. It recognises the complex student demographics of the twenty first century and the busy lives that many students lead as they work and study. However, Middleton (2009) discusses how filling these cognitive voids with knowledge delivered in the form of recorded lectures via podcast feeds is at odds with the drive for learner-centred pedagogy in the higher education sector.

There are other problems with this ‘common sense’ view of podcasting. Firstly, amongst the minority of students that understand the idea of podcasting subscription, most use a PC rather than a portable MP3 player to listen to media (Atkinson, Buntine, & McCrohan, 2007; Evans, 2008; Lane, 2006; Lee &

Chan, 2007; Malan, 2007; Morganteen, 2006; Walls, Kucsera, Walker, Acee, & McVaugh, 2010). Furthermore, Rothwell (2008) and Sutton-Brady, Scott, Taylor, Carabetta, and Clark (2009) specifically highlight students' preference for listening in the informal setting of home. Secondly, though some commentators such as Cebeci and Tekdal (2006) have highlighted the benefits of listening and learning on the move anywhere or anytime, Salmon and Nie (2008) have noticed how students find it difficult to concentrate whilst mobile. Bell, Cockburn, Wingkvist, and Green (2007) show some frustration with the limited vision for how educational podcasting can be used and suggest several ideas of their own including audio announcements, FAQs, hands-free instruction, and feedback to students, as well as involving people from beyond the classroom to reinforce material.

Several authors, including Parsons, Reddy, Wood, and Senior (2009) and Copley (2007), have noted the limited value of recorded lectures as a teaching method. The value of the lecture itself is also regularly challenged as being anachronous in the age of technology-enhanced learning (Benvenuto, 2002; Mayes & de Frietas, 2004) and as being a factor, for example, in the depersonalisation of learning resulting from the massification of education (Bryson & Hand, 2007). Conversely, Mayes, and de Frietas (2004) caution that any use of e-learning needs to be clear about the added value of the 'e'. Similarly, therefore, it is important to understand the value of the 'm' in the case of m-learning.

A further problem with the view that gaps in the daily lives of students can be filled with supplementary listening material is that it misses the idea that audio can be integral, and not just supplementary, by making use of active voices rather than passive ears.

Kukulska-Hulme and Traxler (2005, p. 2) hint at the range of applications for audio by listing mobile learning's attributes as being "spontaneous, personal, informal, contextual, portable, ubiquitous, and pervasive." Lee and Chan (2007) add to this by pointing out, in the context of podcasting, that "it adds yet another modality of learning" (p. 216), signalling that education should seek to innovate with it pedagogically.

To summarise, there is scope to reconsider how audio is used beyond the traditional temporal and spatial situations of higher education where its use is facilitative, active and integral, and where it may involve the voices of learners as much as their capacity to listen. Mobility in this paper, therefore, describes a disrupted and active learning environment that supports connection to the real world, formally and informally.

Addressing Student Diversity Creatively

Bradwell (2009) describes how today's student profile is diverse and universities must avoid inadvertently excluding them. Instead, universities must find ways to be inclusive, accommodating the wider demands of their diverse student body. The idea of the typical student is gone and with it expectations that student engagement will be predictable and regular: These days all students are exceptional. This difference brings many challenges to teaching and learning, including a need to address student isolation, which can lead to student drop out when feelings of pressure and lack of support become overwhelming (Boulos, Maramba, & Wheeler, 2006).

Diversity can also result in pragmatic, content-centric curriculum design and an approach to delivery that is discordant with the escalation of connectedness experienced by students through social networking (Oblinger & Oblinger, 2005; SPIRE, 2007). For example, with reference to the recording and distribution of lectures, it appears that podcasting can deliver learning to everyone irrespective of their ability to be located together in time and place. Such methods, however, offer passive experiences that are especially disappointing and outmoded in the Digital Age of Web 2.0 when the 'net gen' learner is likely to be expecting more interactivity in and beyond the formal curriculum (Conole, de Laat, Dillon, & Darby, 2008).

The Digital Age of Work

A need to consider mobile technology creatively is not only driven by demographic and technical change, but by the imperative of a digitally driven society. In the UK, the *Learning Literacies in the Digital Age* report (JISC, 2009) highlights how the nature of work, learning and knowledge is changing, as is the texture of social life and literacy practices. It suggests education needs to

address this change to ensure that the UK economy is not hampered by “a lack of high-level skills and a dearth of future capacity... The future demands skilled, digitally-aware learners with the capacity to participate in learning throughout their life, using technologies of their own choosing” (JISC, 2009, p. 1).

Disruptive Technology

The wise use of technology may help to ensure students have a rich experience of learning. SPIRE’s review of Web 2.0 technologies (SPIRE, 2007) indicates how it can support both a personally accommodating and socially active student experience, even when it is asynchronous and remote by necessity. Conole et al. (2008) ask whether institutions are matching the array of technologies that students are using every day and, importantly, whether they are observing, and consequently designing around, how those technologies inform the daily lives of students. They argue that student use of technology is now pervasive, personalised, niche adaptive, organised, transferable, redefined in terms of time and space boundaries, characterised by changed working patterns, and integrated.

This offers a useful context for educational audio designers and suggests more attention is paid to what students do in order to understand how audio can bring benefits that match student’s life-wide behaviour.

Education should manage its disruption through innovative development. Digital technologies have proven to be disruptive in many sectors including the newspaper, publishing and music industries. According to Anderson and Elloumi (2004) they also need to be understood as disruptive to education. Disruption is often reported as being problematic, yet disruptiveness has two sides to it: one that undermines the status quo and one that drives innovation through disequilibrium. Being open and creative, therefore, is critical; something that practically and culturally is not easy for large organisations like universities (Tosey, 2006). Education needs to find simple and effective ways of innovating pedagogically, with benefits that are transparent to all involved.

The Producers

The literature on podcasting, discussed in Middleton (2009), is split between the idea of educational podcasting as a teaching space and as a learning space.

Learner-production is just one way in which podcasting can be used in a learner-centred curriculum. Cobcroft, Towers, Smith, and Bruns (2006, p. 5) discuss how learners can be "empowered to undertake user-led education" by using audio to involve their "peers and communities within and beyond the classroom."

Pervasive Voices – Recognising Formal, Semi-Formal and Informal Spaces and Experience

Picking up on Conole et al.'s (2008) keywords, voices are pervasive, personal, niche adaptive, organised, transferable, active in different ways according to time and space, adaptable to changing working patterns and, potentially, easy to integrate. As learners, teachers, experts and publics, our voices and behaviours innately adapt to context. When students in an Audio Notes project were given MP3 recorders and asked to use them in any way that they would find useful to aid their learning, it emerged that they discovered and captured useful learning voices in many varied situations (Nortcliffe & Middleton, 2009a). Most of these situations did not directly connect with a formal view of university education, being categorised as,

- Formal: notes from the planned curriculum;
- Semi-formal: unplanned notes from the formal curriculum; and,
- Informal: notes from beyond the formal curriculum. (*ibid*)

These student initiated applications ranged from the recording of formal events such as lectures and feedback tutorials at one extreme, through semi-formal incidents such as corridor conversations with tutors and peers to clarify understanding, to informal self-initiated recordings such as "idea catching" and impromptu, opportunistic discussions with people not directly involved with their course.

Chan, Lee, and McLoughlin (2006, p. 112) invert the mobile podcasting opportunity from one that provides another channel for pushing content to the learner to one that can liberate "learners from the tyranny of the screen… so learning can coincide with other activities, rather than replacing them." Rather than supplementarity, this suggests coincidence, complementarity and augmentation, with benefits to be found in authentic situations and contrasting

with the idea of deadtime learning through the transmission of knowledge. Supplementarity appears frequently in the literature on podcasting (Bell et al., 2007), whereas complementarity and augmentation would suggest more integration. This holistic, experiential view of university learning resonates with Jackson's concept of *the life-wide curriculum* and his notion of *complete education*, which seeks to embrace personal development, accredited and non-accredited academic learning, real-world application and diverse influences in a student's life, on and off campus (Jackson, 2008). However, he describes the difficulty in extrapolating the learning from complex and immersive learner experiences. Audio, and other recording media, may have a role to play in this extrapolation and delayed replay of intensive and immersive experience, wherever it happens.

Audio Visions

In 2005 Gardner Campbell created a rich and colourful vision for podcasting (Campbell, 2005) which explained how audio was pervasive, accessible and timely. Bull (2005, p. 343) similarly described a world where "the new technology of MP3 players gives users unprecedented power of control over their experience of time and space." But both authors describe a control that is primarily concerned with what will be listened to: what knowledge or entertainment is *received*. Five years later, Campbell's vision of a ubiquitous audio-enhanced curriculum is still a long way off for most; students are not listening to podcast lectures *en masse*, even if the advent of Apple's iTunes U (McKinney, Dyck, & Luber, 2009) implies that they should be.

As the Audio Notes project introduced above demonstrated, digital audio is a flexible, personal and socially unifying medium. It is a connective medium that recognises learning as a dynamic, continuously affected process which is able to capture and asynchronously convey the knowledgeable and enquiring voices that are the essence of learning, irrespective of location or device. In some cases this can be facilitative and provocative: if the opportunity to record had not existed would the conversation ever have happened? De Jong, Specht, and Koper (2008) also recognise the provocative value of mobile technologies and Sharples (2002, p. 509) describes mobile technology as an "environment in which conversational learning takes place," an idea that is developed in 2005

when Sharples asks, how can education itself be transformed by mobile technologies? In terms of MP3 recorders and players, this notion of conversational mediation is particularly useful.

Audio can now be understood as interventionary from a pedagogic design perspective; as a medium that enables connectivity, orientation, motivation, personal and social challenge, and learner reflection. It fits well, therefore, with the needs of the Digital Age learner, but what does audio enhanced learning look like in a mobile context?

Scenario-based design: the generation, sharing and evaluation of ideas

Wali, Winters, and Oliver (2008, p. 56) propose that,

> *future studies look at mobile learning in terms of learning activities taking place across contexts (both physical and social), placing more emphasis on the relationship between learning activities and social context, which has been shown to affect and be affected by learning practices.*

This view informs this paper which presents and discusses a set of scenarios for the mobile use of educational digital audio.

Scenario-Based Design

Ciussi et al. (2009) describe a familiar dilemma in evaluating new and emerging technologies for learning: that they can't be understood until they have been used, yet they can't be used until they have been understood. They found that many students did not understand podcasting and it must be assumed that for early academic adopters there is a similar level of unfamiliarity. This is compounded by Rogers' Diffusion of Innovation theory (Rogers, 1962) which highlights why even good ideas find resistance. Not only are some individuals more reticent than others by nature, but adoption will be governed by different states of readiness. Those categorised as Innovators and Early Adopters may be prepared to take more risk to find benefits, while the Late Adopters and Laggards will wait for sound evidence. Even then they may continue to resist change. Those using the technology will attempt to mitigate the risk, and this in turn may affect the success of the innovation. It is difficult, therefore, to evidence value in anything that is different and new.

Potential therefore needs to be communicated through what Conole et al. (2008) call ‘mediating artefacts’. Case studies, for example, are widely used in education to provide accounts of practice. However, as Cohen, Manion, and Morrison (2001) point out, case study methodology is typically of limited use: case studies report on particular, unique instances of action, and generalising from these is difficult. Bassey (1999), however, describes how case study storytelling techniques can be used to elicit understanding. This idea connects to practice in the discipline of Human Computer Interface design where scenario-based design is used by Computer Scientists to evaluate interface usability before systems are built (Carroll, 2000). He explains that scenarios provide a useful mechanism to evoke and co-ordinate collaborative reflection on designs because “scenarios are at once concrete and flexible” (Carroll, 2000, p. 43). Scenarios also provide mechanisms for looking at imagined interactivity in detail, even whilst ideas and understanding are still emerging. Carroll (2000) explains that scenarios aid communication amongst stakeholders, thereby making design activities more accessible. To be effective, scenarios should have the following characteristics: setting, actors, goals or objectives and actions and events (Potts, 1995).

Mwanza and Engeström (2003) have applied this method to evaluate technology-enhanced pedagogy using story-like descriptions to envision current and future relationships between subjects involved in teaching and learning activities. Milrad (2006) used scenario-based design with groups of workshop participants to evaluate ideas for mobile learning. Scenario-based design and the resultant scenarios, therefore, provide a way to quickly and safely investigate and mitigate the risks of using emerging technologies and to evaluate their pedagogic potential, countering the difficulties facing academic innovation outlined earlier.

Scenarios, therefore, are a useful tool for imagining, demonstrating and evaluating diverse possible digital audio applications.

Six mobile audio learning scenarios

The scenarios discussed here were selected to represent a variety of ideas and starting points relevant to the theme of mobile audio-enhanced learning and

have been reviewed against some of the main tenets arising from the literature already discussed. The six ideas originated in a creativity workshop run by the author involving 70 participants at a meeting of the Podcasting for Pedagogic Purposes Special Interest Group. 176 scenarios for educational podcasting were generated through a facilitated creative process involving academics, learning technologists and educational developers.

The aim of the workshop was to reveal new ways of using audio to enhance learning. Working collaboratively, participants were asked to respond imaginatively to an array of words that had been extracted from the literature on educational podcasting, e-learning and learning technology. Working in pairs, they were randomly assigned three words as the basis for a 'wacky' title. Using the title as a creative trigger, and using word association techniques, each pair were asked to write a description that explained the title and educational value of the approach. Useful scenarios therefore emerged by justifying the title. Later, the titles were used as the basis for other creative conversations that resulted in further ideas. The method took people from positions of comfort and preconception in a safe, collaborative activity to new, less constrained positions. Subsequently the scenarios were typed up, put online for review and then developed into succinct descriptions which have been reviewed at other SIG events and used to seed further idea generation activities.

The six ideas that are discussed here are a subset of the various activities and are indicative of the many ways that students and academics have identified for using audio in a mobile learning context. All of the scenarios selected for discussion here have subsequently been tested and in some cases have been implemented at scale.

Scenarios

1. **a-PDP (audio Personal Development Planning)**

The purpose of this method is to create a rich audio diary to support learner reflection and action planning. Each day, on the way home, a student uses an MP3 recorder or mobile phone memo tool to answer three questions: 1. What have I done today? 2. What have I learnt today? 3. What am I going to do about it? Having made the recording on leaving campus, the student begins the next

day by playing back the previous recording. Periodically the student reviews and reflects upon their brief a-PDP entries, producing considered written summary statements.

2. Audio notes

There are many ways that students can use audio to make notes. One technique is to use a personal MP3 recorder or phone memo tool to summarise a seminar or lecture. This can be particularly useful when this is done co-operatively with other students. Other methods include recording personal ideas, decisions from group work meetings, dissertation supervision, lab notes, etc. Students can also use recording devices to gather feedback from tutors and peers.

3. **Previsit**

Students' engagement in their field trip or museum visit begins as they listen to briefing podcasts on the journey to their visit using materials produced by the tutor, the museum, or students who have been on visits previously.

4. **Field trip commentary**

Student groups on field trips are assigned the task of creating an audio report, perhaps on different themes, so that when they return to college they have a rich collection of material. The recordings can involve interviews with people they meet, observations about places and processes, the ambient sound of the location, discussions with experts and peers, and other information that would not otherwise be available to them. The gathering of data and the making of the commentary provides a framework for enquiry during the trip whilst the expectation of its use motivates them.

5. **User voices**

Medical patient voices (or stories) are collected by academic staff, developers or students. They are used by Health students as a way to encounter patient stories vicariously through digital media. These stories inform various follow-on activities. A Client Voices podcast could use a similar approach in Business modules.

6. Pocketables

A ‘pocketable’ is an audio or video podcast that demonstrates a technique or process. Its purpose is to reduce anxiety prior to the initial performance of that process by the student. Audio, video, screencasts or machinima (films made in 3D Virtual Worlds and games) can all be used to produce such information. In situations where students have been involved in a simulated activity, recordings of their own commentary on their earlier performance can be used to make a direct connection to their learning, thus instilling confidence.

Six mobile audio scenarios discussed

This selection of mobile audio learning scenarios confirm Ciussi et al.’s (2009) suggestion that the medium is capable of supporting both knowledge construction and knowledge sharing, but the scenarios also demonstrate how mobile audio can be used to mediate authentic and active learner engagement in and beyond formal learning spaces. The use of scenarios permits a review of the audio applications in terms of their capacity to: mediate learner engagement; promote learner activity; be integral to the student’s learning experience; provide a platform for learner voices; support learner connection to the world beyond university; and situate the learner across the formal-informal learning continuum.

Mediating Learner Engagement

The Previsit technique, as with other types of preview techniques (Sutton-Brady et al., 2009), is an example of how audio can be used to orientate the learner. The documentary method in the Field Trip Commentary creates a recognisable documentary-like framework that mediates the collective student enquiry and provides a presentation environment. a-PDP is a simple tool that facilitates the capture and transference of learning across media and over time. The User Voices model shifts the focus from both the teacher and the learner to external voices whose presence mediates knowledge construction, whilst the Pocketables method reduces anxiety and instills learner confidence.

Promoting Learner Activity

All of the scenarios presented here put the learner as the central actor with the expectation that they will either act as gatherers of rich data or act in response

to authentic situations. In the Field Trip Commentary scenario, for example, the students gather evidence in many forms because they are expected to create and share a documentary record of their investigations. The a-PDP method uses audio as a support for action planning, whilst the Pocketables methods remind the learner of the techniques they must use.

Integration

Similarly, all of the scenarios present audio as being integral to learning and not as an end in itself. In the a-PDP method the student refers back to what has happened, reflects on what this means, and decides what they should do next because of this. The audio creates a bridge that takes the learner from one day to the next, and later supports a periodic review of their learning. The Audio Notes scenario describes various techniques including the production of audio summaries. Such summaries can, for example, be shared with peers, affecting the social nature of study. In the Previsit model the learner is engaged prior to arrival, thereby affecting the quality of their subsequent experience. In the Field Trip Commentary the richness of sound and voices aids ongoing connection with the initial experience; in the User Voices scenario the listener becomes personally engaged with the experience of the patients or clients and this is used to inform further practical or theoretic engagement. In the Pocketables scenario the learner is reminded of what they have done before, affecting what they do next. In all cases, the audio provides a particular richness and a different view of the subject.

A Platform for Learner Voices

Three of the scenarios are based around the use of student voices. A fourth, Pocketables, can be enhanced by using the learner's own voice. In the Previsit technique an adaptation of the idea would see students producing Previsit materials for next year's cohort. Similarly, the User Voices scenario could position the learners as digital story gatherers. This audio form offers a natural platform for learner presentation; it offers a clear framework for enquiry and reporting and almost demands performance. Performance, in the form of audio presentation, requires a degree of fluency and confidence on the part of the student and this heightens its learning value.

Real World Connection

All of the scenarios describe situations beyond the traditional classroom, with several connecting the learner to real world situations. The Pocketables scenario, for example, supports the learner as they prepare to act in an authentic situation. Empathy with patients and clients and exposure to real world situations can be enhanced by digital audio, as in the case of User Voices. Real world voices are evident in the User Voices and Previsit scenarios too.

Formal, Semi-Formal, and Informal Learning

The a-PDP idea and many of the applications for Audio Notes are simple devices for mediating learner reflection and follow-on activity at the learner's discretion. Ephemeral and incidental conversations that previously happened amongst friends over a cup of coffee can now be collected and reviewed as rich opportunities. Both a-PDP and Audio Notes mediate personal reflection, sometimes in a social context. The situation may not be new, but the use of the recorder allows the ephemeral to be captured. This can turn what was once informal and inconsequential into something that is highly valued. Audio's pervasive capacity can bring value to situations in which learning is immediate or still forming.

Conclusion

The use of scenarios enabled creative thinking in the generation and evaluation of ideas for how digital audio as a form of mobile learning can change modes of engagement in formal, semi-formal and informal learning situations. Scenarios are useful in communicating how innovation can happen, even when stakeholders are not in a position to fully understand the associated benefits and dangers of something because they have not been able to try it in reality; this helps to reduce the associated risk and raise stakeholder confidence. If the literature on educational podcasting has been preoccupied with lecturecasting and other transmissive methods, it may be indicative of how institutional investment in technical systems can deter technology-enhanced learning by sustaining a culture of technology-led thinking. The scenario-based design approach used in the workshops addressed this by facilitating collaborative idea

generating conversations involving diverse technical and pedagogical areas of expertise.

The scenarios described here have demonstrated how mobile audio-enhanced learning can be spontaneous, personal, contextual, portable, ubiquitous and pervasive, and how it can help educators to rethink active and integrated modes of learner engagement, especially in terms of time and space boundaries. Such methods may be disruptive, and therefore challenging; nevertheless, media used simply, in ways similar to those described here, can help academics to make more use of diverse and rich situations. The ready access of the audio medium can be seen as facilitative and involving, rather than as something that dominates the learner's experience. Similarly, mobile audio can be understood as a communicative medium that enables greater connectivity with the world around education, thereby leading to more authentic engagement.

The recording of lectures for use in the learner's 'dead time' is a relatively weak approach to using digital audio in a mobile learning context. Instead it has been shown how audio can address the needs of today's students and their desire for a social, autonomous, active and interactive experience of learning. Many useful voices exist within the formal, semi-formal and informal environments, yet they remain largely untapped. This is likely to change as education recognises audio's potential as a dynamic medium capable of supporting enquiry and reflection amongst its diverse student body.

If Ciussi et al. (2009) have found that some students are unaware of, or uncomfortable with, podcasting it is, as they suggest, likely to have been hampered by the lack of meaningful integration of the media, and this is likely to be a result of the difficulty academia has had in imagining innovative pedagogy. The idea of learning 'anytime anywhere' by listening needs to be reassessed: it is not helpful to think of podcasting as a mobile relay platform for existing pedagogy; instead, audio-enhanced learning should be understood as a new opportunity that affords different ways of engaging the learner. Rather than seeing mobile devices as mechanisms for transmitting and amplifying the teacher's voice, scenario-based design has allowed us to imagine and

concretise views of mobile audio as an active, authentic, social and learner-centred medium.

References

Anderson, T. & Elloumi, F. (2004). Introduction. In Anderson, T. & Elloumi, F. (Eds.), Theory and practice of online learning (pp. 1–11). Athabasca, AB, Canada: Athabasca University Press.

Atkinson, L., Buntine, A., & McCrohan, R. (2007, September 4-6). Podcasting at RMIT University: Evaluating a faculty-based trial. In *Proceedings of the ALT 14th International Conference*, Nottingham, UK.

Bassey M. (1999). Case study research in educational settings: Doing qualitative research in educational settings. Buckingham, UK: Open University Press.

Bell, T., Cockburn, A., Wingkvist, A., & Green, R. (2007). Podcasts as a supplement in tertiary education: An experiment with two computer science courses. In Parsons, D., & Ryu, H. (Eds.), Proceedings of Mobile Learning Technologies and Applications (pp. 70–77).

Benvenuto, M. (2002). Educational reform: Why the academy doesn't change. Thought & Action, 18, 63–74.

Boulos, M., Maramba, I., & Wheeler, S. (2006). Wikis, blogs and podcasts: A new generation of web-based tools for virtual collaborative clinical practice and education. BMC Medical Education, 6(41), 1–8.

Bradwell, P. (2009). *The edgeless university: Why higher education must embrace technology.* Retrieved from http://www.demos.co.uk/publications/the-edgeless-university

Bryson, C. & Hand, L. (2007). The role of engagement in inspiring teaching and learning. Innovations in Education and Teaching International, 44(4), 349–362. 10.1080/14703290701602748

Bull, M. (2005). No dead air! The iPod and the culture of mobile learning. Leisure Studies, 24(4), 343–355. 10.1080/0261436052000330447

Campbell, G. (2005). There's something in the air: Podcasting in education. EDUCAUSE Review, 40(6), 32–47.

Carroll J. M. (2000). Five reasons for scenario-based design. Interacting with Computers, 13(1), 43–60. 10.1016/S0953-5438(00)00023-0

Cebeci Z. , & Tekdal, M. (2006). Using podcasts as audio learning objects. Interdisciplinary Journal of Knowledge and Learning Objects, 2, 47–57.

Chan, A., Lee, M. J., & McLoughlin, C. (2006). *Everyone's learning with podcasting: A Charles Sturt University experience.* Paper presented at the ASCILITE Conference of Who's learning? Whose technology? Sydney, Australia.

Ciussi, M., Rosner, G., & Augier, M. (2009). Engaging students with mobile technologies to support their formal and informal learning. International Journal of Mobile and Blended Learning, 1(4), 84–98. 10.4018/jmbl.2009090805

Cobcroft, R., Towers, S., Smith, J., & Bruns, A. (2006, September 26). *Mobile learning in review: Opportunities and challenges for learners, teachers, and institutions.* Paper presented at the Online Learning & Teaching Conference.

Cohen, L. Manion, L., & Morrison, K. (2001). Research methods in education (5th ed.). London, UK: Routledge.

Conole, G., de Laat, M., Dillon, T., & Darby, J. (2008). Disruptive technologies, pedagogical innovation: What's new? Findings from an in-depth study of students' use and perception of technology. Computers & Education, 50(2), 511–524. 10.1016/j.compedu.2007.09.009

Copley, J. (2007). Audio and video podcasts of lectures for campus-based students: Production and evaluation of student use. Innovations in Education and Teaching International, 44(4), 387–399. 10.1080/14703290701602805

De Jong, T., Specht, M., & Koper, R. (2008). Contextualized media for learning. Journal of Educational Technology & Society, 11(2), 41–53.

Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. Computers & Education, 50(2), 491–498. 10.1016/j.compedu.2007.09.016

Jackson, N. J. (2008). *The life-wide curriculum concept: A means of developing a more complete educational experience?* Retrieved from http://lifewidecurriculum.pbwiki.com/A-more-complete-education

JISC. (2009). *Learning literacies in a digital age*. Retrieved from http://www.jisc.ac.uk.hallam.idm.oclc.org/media/documents/publications/bpllidav1.pdf

Kukulska-Hulme, A., & Traxler, J. (2005). Mobile learning: A handbook for educators and trainers. Boca Raton, FL: Taylor & Francis.

Lane, C. (2006). *UW podcasting: Evaluation of year one.* Seattle, WA: University of Washington. Retrieved from http://www.washington.edu/lst/research_development/papers/2006/podcasting_year1.pdf

Learn Out Loud. (2005). *Dead time learning.* Retrieved from http://www.learnoutloud.com/content/blog/archives/2005/09/dead_time_learn.html

Lee, M., & Chan, A. (2007). Pervasive, lifestyle-integrated mobile learning for distance learners: An analysis and unexpected results from a podcasting study. Journal of Open and Distance Learning, 22(3), 201–218.

Malan, D. J. (2007). Podcasting computer science E-1. In *Proceedings of the 38th SIGCSE Technical Symposium on Computer Science Education*, Covington, KY (pp. 389-393).

Mayes, T., & de Freitas, S. (2004). *Stage 2: Review of e-learning theories, frameworks and models.* Retrieved from http://www.jisc.ac.uk.hallam.idm.oclc.org/uploaded_documents/Stage%202%20Learning%20Models%20(Version%201).pdf

McKinney, D., Dyck, J. L., & Luber, E. S. (2009). iTunes University and the classroom: Can podcasts replace professors? Computers & Education, 52(3), 617–623. 10.1016/j.compedu.2008.11.004

McLuhan M. Fiore Q. (1967). The medium is the massage. London, UK: Penguin Books.

Middleton, A. (2009). Beyond podcasting: Creative approaches to designing educational audio. Journal of Research in Learning Technology, 17(2), 143–155. 10.1080/09687760903033082

Milrad, M. (2006). How should learning activities using mobile technologies be designed to support innovative educational practices? In Sharples, M. (Ed.), Big issues in mobile learning. Nottingham, UK: Kaleidoscope Network of Excellence Mobile Learning Initiative.

Morganteen, J. (2006). Casting around. Museums Journal.

Mwanza, D., & Engeström, Y. (2003, November 7-11). Pedagogical adeptness in the design of e-learning environments: Experiences from the Lab@Future project. In *Proceedings of the World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, Phoenix, AZ.

Nortcliffe, A., & Middleton, A. (2009a, September 8-10). *Audio, autonomy and authenticity: Constructive comments and conversations captured by the learner*. Paper presented at the ALT Conference of In Dreams Begins Responsibility: Choice, Evidence, and Change, Manchester, UK.

Nortcliffe, A., & Middleton, A. (2009b, December 18). iGather: Learners as responsible audio collectors of tutor, peer and self-reflection. In *Proceedings of the National Conference of A Word in Your Ear*, Sheffield, UK.

Oblinger D. G. Oblinger J. L. (2005). Educating the net generation. Washington, DC: EDUCAUSE.

Parsons, V., Reddy, P., Wood J., & Senior, C. (2009). Educating an iPod generation: Undergraduate attitudes, experiences and understanding of vodcast and podcast use. Learning, Media and Technology, 34(3), 215–228. 10.1080/17439880903141497

Potts, C. (1995). Using schematic scenarios to understand user needs. In *Proceedings of the ACM Symposium on Designing Interactive Systems*, Ann Arbor, MI (pp. 247-256).

Rogers, E. M. (1962). Diffusion of innovations. New York, NY: Free Press.

Rothwell, L. (2008). Podcasts and collaborative learning. In Salmon, G. & Edirisingha, P. (Eds.), Podcasting for learning in universities (pp. 121–131). Buckingham, UK: Open University Press.

Salmon, G. & Nie, M. (2008). Doubling the life of iPods. In Salmon, G. & Edirisingha, P. (Eds.), Podcasting for learning in universities (pp. 1–11). Buckingham, UK: Open University Press.

Sharples, M. (2002). Disruptive devices: Mobile technology for conversational learning. International Journal of Continuing Engineering Education and Lifelong Learning, 12(5-6), 504–520. 10.1504/IJCEELL.2002.002148

Sharples, M. (2005, April 28-30). Learning as conversation: Transforming education in the mobile age. In *Proceedings of Communications in the 21st Century: The Mobile Information Society Conference*, Budapest, Hungary.

SPIRE. (2007). Results and analysis of the Web 2.0 services survey undertaken by the SPIRE project. Retrieved from http://www.jisc.ac.uk.hallam.idm.oclc.org/

media/documents/programmes/digitalrepositories/spiresurvey.pdf

Sutton-Brady, C., Scott, K. M., Taylor, L., Carabetta, G., & Clark, S. (2009). The value of using short-format podcasts to enhance learning and teaching. Journal of Research in Learning Technology, 17(3), 219–232. 10.1080/09687760903247609

Tosey, P. (2006). Interfering with interference. In Jackson, N., Oliver, M., Shaw, M., & Wisdom, J. (eds.). Developing creativity in higher education: An imaginative curriculum. London, UK: Routledge, pp. 29–42.

Wali, E., Winters, N., Oliver, M. (2008). Maintaining, changing and crossing contexts: An activity theoretic reinterpretation of mobile learning. Journal of Research in Learning Technology, 16(1), 41–57. 10.1080/09687760701850190

Walls, S. M., Kucsera, J. V., Walker, J. D., Acee, T. W., & McVaugh, N. K. (2010). Podcasting in education: Are students as ready and eager as we think they are? Computers & Education, 54, 371–378. 10.1016/j.compedu.2009.08.018

Reconsidering the role of recorded audio as a rich, flexible and engaging learning space [A3]

Cover sheet and article abstract

Citation:
Middleton, A. (2016). Reconsidering the role of recorded audio as a rich, flexible and engaging learning space. Research in Learning Technology, 24, p. 28035. 10.3402/rlt.v24.28035

This paper argues for the need to reconsider the learner's role in relation to education's use of technology and media. It presents technology ontologically as a rich place of learning engagement. Published in the Association of Learning Technology's journal, it describes the technology and media as being straightforward and versatile. However, it challenges the techno-deterministic and content-centred assumptions evident in the literature on educational podcasting and asserts that an audio-enhanced learning environment can situate the student as being agentic in their own learning experience and that of their peers.

The paper establishes a tension between pedagogy and technology, and then disrupts this by exploring the innovative ontological space that comes from considering the connected voice. It argues that education is "no longer bound to its lecture theatres and classrooms, nor is it dependent on people being co-located, whether they are formally participating in the course or not." Audio accommodates and emphasises the learner's situation and preferences, creating a sense of proximity, social presence and interpersonal connectivity. It challenges, therefore, the primacy of traditional bounded spaces. It implicitly promotes learner agency through a co-operative networked paradigm.

The case study discussed in the paper analyses the innovative pedagogic experience in which audio's influencing affordances are revealed. The pedagogic methods discussed reposition the learner as co-creator in their collective experience and the knowledge it generates. The study identifies the versatility of the audio space through an analytical framework which demonstrates how audio supports new forms of learning activity, disrupts traditional temporal and spatial boundaries, incorporates connective pedagogies, and makes the ephemerality of learning experience significant through its capture and reuse. The recorded voice can be used to share information, experience, ideas, arguments, and feedback, while promoting discursive forms of engagement. Audio-enhanced learning, therefore, is indicative of a reconceived technologically mediated learning experience. [299]

Abstract

Audio needs to be recognised as an integral medium capable of extending education's formal and informal, virtual and physical learning spaces. This paper reconsiders the value of educational podcasting through a review of literature and a module case study. It argues that a pedagogical understanding is needed and challenges technology-centred or teacher-centred understandings of podcasting. It considers the diverse methods being used that enhance and redefine podcasting as a medium for student-centred active learning. The case study shows how audio created a rich learning space by meaningfully connecting tutors, students and those beyond the existing formal study space. The approaches used can be categorised as new types of learning activity, extended connected activity, relocated activity, and recorded 'captured' activity which promote learner replay and re-engagement. The paper concludes that the educational use of the recorded voice needs to be reconsidered and reconceptualised so that audio is valued as a manageable, immediate, flexible, potent and engaging medium.

Introduction

Educational podcasting is frequently discussed as a supplementary medium (Bell *et al.* 2007; Copley 2007; Lonn and Teasley 2009) making it irrelevant to many academic innovators. This belies its transformative potential as set out in this paper. As Heilesen says (2010), 'many students experience podcasts as a genuine improvement to the study environment' (p. 1063). There is a need, therefore, to reconsider educational podcasting and reconceptualise it as a rich learning space for student-centred active learning.

Fernandez, Simo, and Sallan (2009, p. 391), having appreciated what can be achieved with audio, concluded that future research should 'examine the differences among the academic uses for podcasting, and how these different uses can be combined on the same course'. This paper presents a case study describing the impact of podcasting as a flexible extension to the existing

physical and virtual learning environment capable of accommodating many different types of pedagogic intervention in an undergraduate Computing module.

Educational podcasting is first defined and a review of relevant literature is presented. These inform a case study of practice. Evidence from the literature, Puentedura's (2014) SAMR (Substitution Augmentation Modification Redefinition) model of how technology influences teaching and learning, and lessons from the case study are used to establish a taxonomy of audio-enhanced learning. This shows how podcasting can facilitate pedagogic change using intended or opportunistic approaches.

Defining educational podcasting

Educational podcasting can be understood as either a technical or pedagogic phenomenon.

Technically speaking, podcasting is the serial distribution of locally generated downloadable digital media episodes, usually audio, via RSS (Really Simple Syndication) feeds to niche audiences of subscribers. RSS incorporates structured information about the podcast channel and the appended items ('episodes'). In this way the RSS feed file can be automatically and regularly checked by the end-user's aggregation software (e.g. iTunes), which triggers the downloading of new episodes whenever they become available.

Alternatively, Lazzari (2009, p. 88) disregards the need for a formal RSS channel,

> *A podcast is a method for distributing any digital media file, or series of files, over the Internet for playback on portable media players, such as iPods, and personal computers.*

Pedagogically educational podcasting is defined differently as,

> *The finding, making and sharing of the recorded voices of tutors, learners, experts and others as a common space promoting learning through exposition, dialogue, encounter, social presence and enquiry.*

Considering assumptions and other research problems

Kirkwood and Price (2013) highlight the importance of challenging assumptions about, and distinguishing between, the pedagogic and technical benefits of innovations in educational technology research. They also say more attention needs to be given to making clear the educational philosophy of papers reporting on innovation; for example, those that adopt teacher-centred assumptions and those that assume a learner-centred view.

Further weaknesses of the literature on technology-enhanced learning, including educational podcasting, concern the inappropriate generalisation of claims and an overdependence on comparative methods: those which involve 'comparing the outcomes from teaching one group (or more) using some form of technology with those of a control group taught by a more ''conventional'' method' (Kirkwood and Price 2013, p. 538).

The inadvertent making of generalised claims can be a result of authors failing to appreciate the significance of the specific situation in which their studies are conducted. There is, for example, a surprising lack of reference to the idea of signature pedagogies (Shulman 2005) in which disciplinary context is a key factor.

Literature frequently depends on discredited assumptions about learning styles. Waring and Evans (2015) examine the myths of learning styles, Zhang (2015) the cognitive malleability of learners' intellectual styles, and Hattie and Yates' (2013) assert that we are all capable of learning effectively in multi-modal situations where different media are used.

Student inclusion also warrants greater attention in this literature. It is notable that audio, therefore, is often cited as a medium that promotes the inclusion of people with dyslexia who benefit from working with non-text-based media or those who are partially deaf who value being able to playback recordings and listen carefully to classroom activities (MELSIG 2014). Often it is incorrectly assumed that text is adequate for all students.

The incompatibility of technical and pedagogic perspectives

Much of the podcasting literature takes a technical and teacher-centred bias and presents the medium as an opportunity for conveying and supplementing

the dominance of the teacher's voice. Alternatively, Pegrum, Bartle, and Longnecker (2015) view podcasting from the position of deep learning, especially where students are involved in 'creative podcasting' or 'learner-generated' podcasting (Dale and Povey 2009; Lee, McLoughlin, and Chan 2007; Middleton 2013).

The techno-centric view ignores the transformative opportunity to engage the learner in different, more challenging ways. This is understandable: the academic must manage the risk of using novel technology, though this diminishes the chance of pedagogic innovation. Bolliger and Des Armier (2013) note that one of the problems with the research in this area is that the student subjects are *also* always novices and their first experience of an active mode of pedagogy often coincides with these innovations.

Sometimes the pedagogic exigency can be so strong that innovation is almost bound to happen. This is the case with the use of audio feedback, its rationale being the need to provide more personal, timely and meaningful feedback to students on their work (e.g. Gould and Day 2013; Rotheram 2007). This rationale clarifies its technical requirement to simply record the voice of the person giving feedback in a way that can be easily returned to the student. The perceived technical complexity of podcasting is mostly absent in case studies on audio feedback where its pedagogic rationale would seem to dispel any associated anxiety of the academic producer.

The technical definition above introduces the idea of serialised episodes. Serialisation can be understood as meaning regular and designed publications released according to a schedule using a particular format and voices (Edirisingha, Salmon, and Nie 2008). However, the pedagogical imperative suggests there is no reason why audio learning materials should be regular in format or schedule. Learning structure is important, but within that materials can be irregular, spontaneous, and delivered according to specific needs, featuring different voices, in different combinations, at different times, for different durations, with different purposes, as opportunities present themselves. Indeed, audio as a medium reflects one of the strongest attributes of the academic voice: its flexibility.

The pedagogic definition describes podcasting as a ‘common space’. Control of the space is intentionally ambiguous; there is no reason, beyond tradition, why such an environment cannot be used and managed by the learner, especially as there is a growing appreciation of personal and socially mediated learning spaces (Dabbagh and Kitsantis 2012).

The pedagogic definition indicates how educational podcasting encourages and values the academic spoken word as an alternative to written media and how it is possible to break away from the constraints of pre-Digital Age education in which written media have dominated learning. Education is theoretically no longer bound to its lecture theatres and classrooms, nor is it dependent on people being co-located, whether they are formally participating in the course or not. Similarly, and importantly from a learner-centred perspective, information, ideas and argument communicated as spoken word can be accessed and reused when the learner determines that doing so is valuable to them, including when the recorded voices they hear are their own.

A review of literature on educational podcasting

Common themes

Studies of educational podcasting have addressed a number of themes: technical methods and barriers; coursecasting or lecture capture (Middleton 2009); learning by listening (Edirisingha 2006); the capacity of the medium to supplement existing pedagogy (Hill and Nelson 2011; McLean and White 2009); the effect of recorded lectures on attendance (Parson *et al.* 2009); the readiness of students to use their personal devices to access podcasts (Atkinson, Buntine, and McCrohan, 2007). All these are discussed by Walls *et al.* (2010) who also highlight other common findings: most students do not know about podcasting feeds and most students use a PC, rather than a portable device to listen to educational media (Atkinson, Buntine, and McCrohan, 2007; Evans 2008; Lane 2006; Lee and Chan 2007; Malan 2007; Morganteen 2006). Rothwell (2008) and Sutton-Brady *et al.* (2009) specifically highlight students’ preferences for listening in the informal home setting.

Enhanced learning: supplemented, complemented or augmented?

Much of the discourse on supplemental podcasts assumes lecturing to be the dominant pedagogy and, rather than being pedagogically critical, they are additional and optional. Parson *et al.* (2009) discuss podcasting's capacity to substitute for the lecture experience, finding that additional material is useful, whatever the format, but that university students still perceive lectures to be their main source of learning and that they should not be replaced by online material. Fernandez, Simo, and Sallan (2009, p. 391) conclude that 'podcasting is a powerful tool as a complement to the traditional resources on a course, but not a substitute for them'. They also assert that podcasting increases 'the impression of permanent contact between students and teachers', describing the benefits of this on students' motivation and how it can increase variety in the ways that students are engaged. Mount and Chambers (2008) caution that simply substituting one medium for another is unlikely to have any significant learner benefits unless the fundamental pedagogy is changed.

Discussion about the verisimilitude or reliability of the recorded voice is found in other literature, such as that on audio feedback (France and Wheeler 2007; Gould and Day 2012; Rotheram 2007) in which students particularly value the new proximity they have to their tutors and peers and how spoken word reduces misinterpretation of feedback (Sipple 2007). This proximity establishes a different sense of social presence and interpersonal connectivity (Harrison et al. 2014; King, McGugan, and Bunyan 2008; Lunt and Curran 2010; Nortcliffe and Middleton 2007). The use of audio is expressed as redefining academic practice in some literature on audio feedback (Gould and Day 2013; Laughton 2013).

Bolliger, Supanakor, and Boggs (2010) researched the effects of various podcasting pedagogies including introductory, lecture and supplementary podcasts and found that each type can positively impact learner motivation and attentiveness. Popova, Kirschner, and Joiner (2014, p. 337) say that, 'If podcasts are thoughtfully integrated into the existing and still prevailing use of lectures, they have the potential to enhance deeper levels of learning, especially if they involve students in carrying out epistemic tasks'.

Methods for learner engagement

Assignments

Sutton-Brady *et al*. (2009) discuss the production of short-format podcast episodes in setting and supporting assignments. They describe how the assessment task, guidelines for undertaking the task, and feedback on the task can all be delivered using a common podcast channel.

Authentic voices

Rothwell (2008, p. 131) highlights how 'podcasting offers the possibility of building a database of authentic ''voices,'' rich in meaning potential, constructed and managed by students in collaboration with tutors while Downward *et al.* (2008) discuss how students can gather authentic voices and sounds on field trips.

Preview and review

Preview techniques (Aliotta *et al.* 2007; Bell *et al.* 2007) and pre-visit techniques (Middleton 2010) have a similar purpose to the student-generated techniques discussed by Lee, McLoughlin, and Chan (2007) who describe how media can be used to engage and prepare the learner before they meet in person.

Popova, Kirschner, and Joiner (2014) describe their use of 'primer podcasts' to stimulate prior knowledge activation and self-questioning. Audio is used to help students better understand new concepts, with epistemic questioning encouraging deeper learning in their integrated view of podcasting. They found that 'explaining core concepts and providing structure before a lecture gives students an opportunity to make sense of what they learn' (p. 331). This is recognisable as a 'flipped classroom' approach (Bergmann and Sams 2012).

Audio can be used to capture either the essence or the detail of a situation as well as key 'take away' points. Brittain *et al.* (2006), Evans (2008) and Parson *et al.* (2009) discuss whether the recording of lectures is able to support exam revision. Others (Copley 2007; Frydenberg 2008; Guertin 2010; Middleton 2010; Rothwell 2008; Rushton *et al.* 2015) discuss alternative techniques such as audio summaries which involve students taking responsibility for summarising significant events or readings. Summarising is a valuable learning technique and the sharing of the recordings adds a valuable social dynamic.

Lonn and Teasley (2009) use the term ‘review’ to embrace learner reflection and revision techniques, methods that also provide access to content for those who missed the original event. Short audio revision notes (Middleton 2010) in which the listener is encouraged to develop what they hear by writing their own response, emphasises cognitive transference through the change in medium. Rothwell (2008) used a similar approach and Guertin (2010) takes a 25-question quiz approach to audio revision.

Learner-generated podcast assignments

Bolliger and Des Armier (2013) evaluated the integration of student-generated audio and found that it fostered student engagement and involvement, assisting them in effectively connecting and communicating with peers and increasing their learning. When used well, the recorded voice enriches learning by enhancing a feeling of social presence. This was also noted by Dale and Pymm (2009).

In four studies at two universities McElearney and Middleton (2013) found that students relished podcast assignments which required them to work in different and more creative ways. Most of the students valued the process of making podcasts together as available learning activity, with several being very enthusiastic about working with digital media. The change and challenge that the media affords and the capacity for group assignments to develop the students’ confidence, creativity and critical abilities were appreciated. McLean and White (2009) and Smith and Sodano (2011) also found that the iterative process involved in student-generated audio assignments promotes learner self-assessment.

Lee, McLoughlin, and Chan (2007) found that student podcast production offers a shared context that supports learner creativity and collaborative negotiation of meaning, thus underpinning knowledge creation. Student-generated podcasting reduced anxiety and heightened engagement through the co-production of background material. McLoughlin, Lee, and Chan (2006, p. 39) noted that ‘placing students in the roles of producers encourages them to engage in metacognitive thinking about learning, as they create podcast episodes’. Lee and McLoughlin (2007, p. 5) discuss the benefits of user-

generated content in the context of education with students acting as both 'producers and consumers (''prosumers'') of knowledge, ideas, and artifacts', and Dale and Povey (2009) describe how podcast assignments were found to be highly motivational, developing students' theoretical understanding, practical skills and employability.

Audio as an autonomous and smart medium

Downward *et al.* (2008, p. 69) value 'the flexible and adaptive nature of podcasting as a communicating and integrating tool that can be readily developed by staff and students'. This flexibility, when combined with the ubiquity of smart and portable devices, indicates the range of possible pedagogic podcasting applications. This has informed investigations, for example, into how students can gather significant conversations and how such technologies help support idea generation and learner reflection in formal and informal situations (Middleton and Nortcliffe 2009). Accounts of 'smart learning' and BYOD (Bring Your Own Devices) for learning continue to change our learning context (Middleton 2015).

Audio is a flexible medium and simple to use and produce. It is also immediate and responsive: the ubiquitous microphone being adept at capturing ideas, conversations, discussions and insight (Nortcliffe, Middleton, and Rossiter 2013).

Module case study

The tutor aimed to establish an accessible, responsive and adaptable extension to the existing physical and virtual learning environment by incorporating the voices of the tutor, students, and invited or found external contributors.

Context

The module's aim was to develop practical computing skills (AJAX powered Web 2.0 websites) alongside the theory and application of creativity and innovation amongst final year undergraduate Computing students. It had a cohort of 13 students attending a 2-hour class each week and ran over two semesters led by two teachers. One had responsibility for the practical elements and the other (the author) for the theory. An enquiry-based learning approach was used (Kahn and O'Rourke 2004). Topics included the management of

personal and professional identity, creativity and innovation, and methods for designing and implementing online media.

Tutor and class recordings were created using a portable MP3 recorder or a smartphone and posted directly to the module's Blackboard site during class or shortly after. Other unedited tutor recordings, such as briefings, feedback and revision notes, were loosely scripted and produced at home or in a meeting room. Three interviews were conducted with external contributors for which short introductions were recorded with minimal editing. Later episodes featured students' own digital story assignments with other episodes being made up of recordings from other podcast channels and websites.

Establishing a discursive learning space

A 'module ethos' document was produced in Week 1 by the tutors with the students, drawing upon an ethical framework (Regan *et al.* 2011). This helped to establish the discursive, enquiry-based learning approach.

The classes were conducted in a computer lab. Its fixed layout and distracting PCs led to students being asked to wheel their chairs to the 'teaching' area of the room where they formed a circle which helped to focus class discussions. A recorder was either placed at the group's centre or passed around as a useful tool for seeking student contribution. Students responded well to the situation that was created. These techniques were used carefully with the tutor being sensitive to recording those students who appeared to find the approach difficult.

The recorder's portability was notable for accommodating the diverse recordings.

Analysis of episodes using a measure of pedagogic innovation

40 episodes were distributed through the module podcast channel which can be analysed using four innovation categories, each with a descriptive hypothesis.

New activity

Hypothesis: audio podcasting resulted in new forms of learning activity.

The podcast channel was used by the tutor as a reflective space, especially during the earlier formative stages of the module. In Week 1 the tutor reflected

on the development of the module ethos and an in-class SWOT (Strengths, Weaknesses, Opportunities and Threats) Analysis activity. In Week 3 the entry for the episode description reads, ‘Just thought I would capture a few thoughts on how the Video Challenge is going. Hope this is helpful’. The audio content and its description were conversational and intended to establish a facilitative tone; earlier discussion had revealed some reticence amongst the Computing students to talk.

Four topics were introduced during the module by raising epistemic questions and presenting ideas in a monologic form.

Episode four, entitled ‘Responsible Producers’, is an example of where the tutor brought in external ‘voices’ into the learning environment; people who would otherwise not have been heard. The recording features an interview with a professional acquaintance who shared her own experience of ethical conflict in her role: a rich and valuable story helping to bring the module topic to life. This opportunistic recording created a powerful reference point illustrating dilemmas associated with producing user-generated content.

An engaging PowerPoint on the topic of ‘The Future of Employment’ was found on the presentation-sharing website Slideshare. The tutor recognised the value and authority of the original source, but wanted to critique some of the ideas and decided to produce a spoken commentary on the presentation that worked in the same way that a director’s commentary works on a movie DVD.

Connected activity

Hypothesis: audio podcasting resulted in connected activity, often involving people not directly associated with the module or the university.

Connections were made on several occasions between module topics and news in the world beyond. Several episodes came from other podcasts and radio programmes published while the module was running:

- A podcast by an online newspaper about Web 2.0 ‘mash ups’ in the real world featuring an interview with Sir Tim Berners-Lee;
- A US podcast discussion about online identity, which connected with one of the assignments;

- A 45-minute panel discussion from an educational technology podcast which presented alternative perspectives about online identity;
- A radio programme about the German motor industry, which addressed the topic of 'Creativity and Innovation'. Linked from Blackboard, students were asked to listen prior to attending the class that week.

Though this category may appear to be about supplementary content, the approach is better understood as an integrative 'flipped classroom' model because the recordings provided the context for in-class activity and assignments.

Relocated activity

Hypothesis: audio podcasting resulted in a relocation of activity temporally and spatially.

Twenty-two of the episodes can be categorised as being relocated activity. However, within this there are 12 Audio Revision Notes, three pieces of Generic Audio Feedback, and four student presentations. Without the podcast channel, these activities would have necessitated more class time.

Audio Revision Notes lasting 5 minutes were produced by the tutor in the latter half of the module to help students distil their personal experiences of earlier activities. Each recording listed five key points for a topic. Students were advised to note each point in writing and develop it according to their own experience and research. In this way subsequent playback of these audio notes was intended to trigger recall of the learner's own knowledge.

Generic Audio Feedback was given on all three assignments at the earliest opportunity. This enabled key points to be made while the students were still close to their assignment and to inform subsequent activities. Students were asked to compare their performance with that of their peers in relation to the points raised.

The last assignment required student groups to produce podcast presentations lasting less than 2 minutes as a way to present their findings from their enquiries in a non-written form for the benefit of a wider audience. This

complemented their written project report. Relocation here developed fluency by moving reporting from one medium to another.

Other episodes where relocation characterised activity included:

- an interview with an expert which could not happen in class for logistical reasons;
- a topic presentation for which there was no class time available;
- a book review.

Captured activity

Hypothesis: audio podcasting resulted in re-engagement with activity that was previously ephemeral in nature.

Earlier work had revealed how recording classroom activity can be valuable where learners are distracted by anxiety or engagement in classroom activities (Nortcliffe, Middleton, and Rossiter 2013). Recording allows the learner to reflect on their own contributions and to pay closer attention to contributions and responses made by peers. Furthermore, it is possible that listening back to discussions allows the listener to make further connections to the original discussion.

Two of the podcasts took the form of Audio Assignment Briefs which were produced in class by the tutor who expanded on points and answered questions about the briefing document. Sutton-Brady *et al.* (2009) discuss a similar method. It was critical to properly establish the basis for the assessed tasks, yet class attendance was uneven. The recording allowed each learner to reconnect with it when it became more meaningful for them. Therefore, relocation here means a user-defined spatial and temporal relocation.

At another point, students were involved in creative classroom problem-solving activities. Their contributions were recorded, capturing both the fun and the outcomes of the exercise.

Conclusions

Lecture recording supplements and reinforces the existing pedagogy. Barr and Tagg (1995, p. 25) note however,

> *One early sign of a paradigm shift is an attempt to use the tools and ideas of a new paradigm within the framework provided by the old, or to convey information intelligible in the new paradigm through the channels of the old.*

It is now clear that the recorded voice can be used to transform pedagogy. It can be used to share information, experience, ideas, arguments, feedback, and to promote discursive engagement. Audio establishes a new type of learning space: one full of social presence, unconstrained by time or place. It provides an additional space which *can* be used to supplement existing pedagogies but, more importantly, it can also mediate new types of learning activity, develop and relocate existing activity, and support the review of class activity. It is a space for listening and speaking, enquiry and co-production.

Such interventions can extend the nature and value of existing activity, temporally and spatially, and should encourage innovators to confidently discover new opportunities for student-centred active learning as outlined in the Audio-Enhanced Learning Taxonomy (Table 1).

Future research will continue to develop thinking about how academics and students can use the recorded voice by exploring the boundaries of the formal learning space to foster belonging.

This paper has demonstrated how the educational use of the recorded voice needs to be reconsidered and reconceptualised so that audio is valued as a manageable, immediate, flexible, potent and essentially engaging medium.

Table 1. Audio-enhanced learning taxonomy with reference to SAMR.

	Innovation	Description	SAMR
1.	New activity	Use of the audio results in new forms of learning activity.	*Transformation-Redefinition* _ allows for the creation of new tasks, previously inconceivable
2.	Connected activity	Use of the audio results in an extension to activity, often involving people not directly	*Transformation-Redefinition* _ allows for the creation of new tasks, previously

		associated with the module or the university.	inconceivable
3.	Relocated activity	Use of the audio results in a relocation of activity temporally and spatially.	*Enhancement-Modification* _ allows for significant task redesign
4.	Captured activity	Use of the audio results in re-engagement with activity that previously was ephemeral in nature.	*Enhancement-Augmentation* _ acts as a direct tool substitute, with functional improvement

References

Aliotta, M., *et al*., (2007) 'Assessing the impact and potential of podcasts as pre-lectures', *Proceedings of ALT-C 2007*, Nottingham, UK.

Atkinson, L., Buntine, A. & McCrohan, R. (2007) 'Podcasting at RMIT University: evaluating a faculty-based trial', *Proceedings of ALT-C 2007*, Nottingham, UK.

Barr, R. & Tagg, J. (1995) 'From teaching to learning: a new paradigm for undergraduate education', *Change*, vol. 27, no. 6, pp. 13_25.

Bell, T., *et al*., (2007) 'Podcasts as a supplement in tertiary education: an experiment with two computer science courses', in *Proceedings of the Mobile Learning Technologies and Applications (MoLTA)*, eds. D. Parsons & H. Ryu, Institute of Information and Mathematical Sciences, Massey University, Auckland, New Zealand, pp. 70_77.

Bergmann, J. & Sams, A. (2012) Flip Your Classroom: Reach Every Student in Every Class Every Day, ISTE and ASD, Washington, DC.

Bolliger, D. U. & Des Armier, D., Jr. (2013) 'Active learning in the online environment: the integration of student-generated audio files', *Active Learning in Higher Education*, vol. 14, no. 3, pp. 201_211.

Bolliger, D. U., Supanakorn, S. & Boggs, C. (2010) 'Impact of podcasting on student motivation in the online learning environment', *Computers & Education*, vol. 55, no. 2, pp. 714_722.

Brittain, S., *et al*., (2006) 'Podcasting lectures: formative evaluation strategies helped identify a solution to a learning dilemma', *EDUCAUSE Quarterly*, vol. 29, no. 3, pp. 24_31.

Copley, J. (2007) 'Audio and video podcasts of lectures for campus-based students: production and evaluation of student use', *Innovations in Education and Teaching International*, vol. 44, no. 4, pp. 387_399.

Dabbagh, N. & Kitsantas, A. (2012) 'Personal learning environments, social media, and self-regulated learning: a natural formula for connecting formal and informal learning', *Internet and Higher Education*, vol. 15, pp. 3_8.

Dale, C. & Povey, G. (2009) 'An evaluation of learner-generated content and podcasting', *Journal of Hospitality, Leisure, Sport and Tourism Education*, vol. 8, no. 1, pp. 117_123.

Dale, C. & Pymm, J. M. (2009) 'Podagogy: the iPod as a learning technology', *Active Learning in Higher Education*, vol. 10, no. 1, pp. 84_96.

Downward, S., *et al*., (2008) 'Podcasts and locations', in *Podcasting for Learning in Universities*, eds. G. Salmon & P. Edirisingha, Open University Press,Maidenhead, pp. 57_69.

Edirisingha, P. (2006) 'The ''double life'' of an iPod: a case study of educational potentials of new technologies', [online] Available at: http://www2.le.ac.uk/departments/beyonddistance-

research-alliance/disseminationactivities/conferences/2006/OnlineEduca2006/OnlineEduca2006Presentations/double_ipod

Edirisingha, P., Salmon, G. & Nie, M. (2008) 'Developing pedagogical podcasts', in *Podcasting for Learning in Universities*, eds. G. Salmon & P. Edirisingha, Open University Press, Maidenhead, pp. 153_168.

Evans, C. (2008) 'The effectiveness of m-learning in the form of podcast revision lectures in higher education', *Computers & Education*, vol. 50, no. 2, pp. 491_498.

Fernandez, V., Simo, P. & Sallan, J. M. (2009) 'Podcasting: a new technological tool to facilitate good practice in higher education', *Computers & Education*, vol. 53, no. 2, pp. 385_392.

France, D. & Wheeler, A. (2007) 'Reflections on using podcasting for student feedback', *Planet*, vol. 1, no. 18, pp. 9_12.

Frydenberg, M. (2008) 'Principles and pedagogy: the two Ps of podcasting in the information technology classroom', *Information Systems Education Journal*, vol. 6, no. 6, pp. 3_11.

Gould, J. & Day, P. (2012) 'Hearing you loud and clear: student perceptive of audio feedback in higher education', *Assessment & Evaluation in Higher Education*, pp. 1_13, [online] Available at: http://dx.doi.org/10.1080/02602938.2012.660131

Gould, J. & Day, P. (2013) 'Hearing you loud and clear: student perspectives of audio feedback in higher education', *Assessment & Evaluation in Higher Education*, vol. 38, no. 5, pp. 554_566.

Guertin, L. A. (2010) 'Creating and using podcasts across the disciplines', *Currents in Teaching and Learning*, vol. 2, no. 2, Spring 2010, pp. 4_12.

Harrison, C. J., *et al.*, (2014) 'How we give personalised audio feedback after summative OSCEs', *Medical Teacher*, pp. 1_4, [online] Available at: http://www.ncbi.nlm.nih.gov/pubmed/24989869

Hattie, J. & Yates,G. (2013) *Visible Learning and the Science of HowWe Learn*, Routledge, London.

Heilesen, S. B. (2010) 'What is the academic efficacy of podcasting?', *Computers & Education*, vol. 55, no. 3, pp. 1063_1068.

Hill, J. L. & Nelson, A. (2011) 'New technology, new pedagogy? Employing video podcasts in learning and teaching about exotic ecosystems', *Environmental Education Research*, vol. 17,no. 3, pp. 393_408.

Kahn, P. & O'Rourke, K. (2004) *Guide to Curriculum Design: Enquiry-Based Learning*, Centre for Excellence in Enquiry-based Learning, [online] Available at: http://www.ceebl.manchester.ac.uk/resources/guides/kahn_2004.pdf

King, D., McGugan, S. & Bunyan, N. (2008) 'Does it make a difference? Replacing text with audio feedback', *Practice and Evidence of the Scholarship of Teaching and Learning in Higher Education*, vol. 3, no. 2, pp. 145_163.

Kirkwood, A. & Price, L. (2013) 'Examining some assumptions and limitations of research on the effects of emerging technologies for teaching and learning in higher education', *British Journal of Educational Technology*, vol. 44, no. 4, pp. 536_543. doi: http://dx.doi.org/10.1111/bjet.12049

Lane, C. (2006) *UW Podcasting: Evaluation of Year One*, Technical Report, Office of Learning Technologies, University of Washington. [online] Available at: https://www.washington.edu/itconnect/wp-content/uploads/2013/12/podcasting_year1.pdf

Laughton, D. (2013) 'Using audio feedback to enhance assessment practice: an evaluation of student and tutor experiences', *Student Engagement and Experience Journal*, vol. 2, no. 2, pp. 1_20.

Lazzari, M. (2009) 'Creative use of podcasting in higher education and its effect on competitive agency', *Computers & Education*, vol. 52, no. 1, pp. 27_34.

Lee, M. J. W. & Chan, A. (2007) 'Pervasive, lifestyle integrated mobile learning for distance learners: an analysis and unexpected results from a podcasting study', *Open Learning*, vol. 22, no. 3, pp. 201_218.

Lee, M. J. W. & McLoughlin, C. (2007) 'Teaching and learning in the Web 2.0 era: empowering students through learner-generated content', *International Journal of Instructional Tech*

nology and Distance Learning, vol. 4, no. 10, [online] Available at: http://www.itdl.org/Journal/Oct_07/article02.htm

Lee, M. J. W., McLoughlin, C. & Chan, A. (2007) 'Talk the talk: learner-generated podcasts as catalysts for knowledge creation', *British Journal of Educational Technology*, vol. 39, no. 3, pp. 501_521.

Lonn, S. & Teasley, S. D. (2009) 'Podcasting in higher education: what are the implications for teaching and learning?', *Internet and Higher Education*, vol. 12, pp. 88_92.

Lunt, T. & Curran, J. (2010) '"Are you listening please?" The advantages of electronic audio feedback compared to written feedback', *Assessment & Evaluation in Higher Education*, vol. 35, no. 7, pp. 759_769.

Malan, D. J. (2007) 'Podcasting computer science E-1', Paper Presented at the 38th SIGCSE Technical Symposium on Computer Science Education, Covington, Kentucky.

McElearney, G. & Middleton, A. (2013) 'Valuing podcasting: students talk about their experience of educational podcasting', in *Digital Voices: A Collaborative Exploration of the Recorded Voice in Post-Compulsory Education*, ed. A. Middleton, MELSIG & Sheffield Hallam University, Sheffield, UK, pp. 67_78.

McLean, D. & White, E. R. (2009) 'Two approaches to podcasting use in the classroom', *Journal of Online Learning and Teaching*, vol. 5, no. 2, pp. 336_347. McLoughlin, C., Lee, M. J. W. & Chan, A. (2006) 'Using student generated podcasts to foster reflection and metacognition', *Australian Educational Computing*, vol. 21, no. 2, pp. 34_40.

MELSIG. (2014) 'Digital media interaction and inclusivity: the use of digital and social media promoting inclusivity and interaction to enhance and transform learning', *Proceedings of the Media-Enhanced Learning Special Interest Group Event*, 9 Sep., 2014, University of Sussex, [online] Available at: http://melsig.shu.ac.uk/?page_id_645

Middleton, A. (2009) 'Beyond podcasting: creative approaches to designing educational audio', *Research in Learning Technology*, vol. 17, no. 2, pp. 143_55.

Middleton, A. (2010). 'Reclaiming mobile audio: active learner-gatherers across the forma-linformal continuum', in *Proceedings of Mobile Learning 2010, IADIS International Conference*, Porto, Portugal, 19_21 March 2010.

Middleton, A. (2013). 'Educational podcasting: understanding the opportunity', in *Digital Voices: A Collaborative Exploration of the Recorded Voice in Post-Compulsory Education*, ed. A. Middleton, MELSIG & Sheffield Hallam University, Sheffield, UK, pp. 2_8.

Middleton, A., ed. (2015). Smart Learning: Teaching and Learning with Smartphones and Tablets in Post-Compulsory Education. MELSIG & Sheffield Hallam University, Sheffield, UK.

Middleton, A., & Nortcliffe, A. (2009) 'iGather: learners as responsible audio collectors of tutor, peer and self reflection', Paper presented at 'A Word In Your Ear 2009', Sheffield Hallam University, UK, 18 December 2009, [online] Available at: http://research.shu.ac.uk/lti/awordinyourear2009/papers.html

Morganteen, J. (2006) 'Casting about', *Museums Journal*, [online] Available at: http://www.museumsassociation.org/about/12862 Mount, N. & Chambers, C. (2008) 'Podcasts and practicals', in *Podcasting for Learning in Universities*, eds. G. Salmon & P. Edirisingha, Open University Press, Maidenhead, pp. 43_56.

Nortcliffe, A., & Middleton, A. (2007) 'Audio feedback for the iPod Generation', in *Proceedings of International Conference on Engineering Education _ ICEE 2007*, Coimbra, Portugal, 3_7 September 2007. pp. 3_5. [online] Available at: http://ineerweb.osanet.cz/Events/ICEE2007/papers/489.pdf

Nortcliffe, A., Middleton, A. & Rossiter, A. (2013) 'Learners take control: audio notes for promoting learner autonomy', in *Digital Voices: A Collaborative Exploration of the Recorded Voice in Post-Compulsory Education*, ed. A. Middleton, MELSIG & Sheffield Hallam University, Sheffield, UK, pp. 55_66.

Parson, V., *et al*., (2009) 'Educating an iPod generation: undergraduate attitudes, experiences and understanding of vodcast and podcast use', *Learning, Media and Technology*, vol. 34, no. 3, pp. 215_228.

Puentedura, R. (2014) 'SAMR: a contextualised introduction', [online] Available at: http://www.hippasus.com/rrpweblog/archives/2014/01/15/SAMRABriefContextualizedIntroduction.pdf

Pegrum, M., Bartle, E. & Longnecker, N. (2015) 'Can creative podcasting promote deep learning? The use of podcasting for learning content in an undergraduate science unit', *British Journal of Educational Technology*, vol. 46, no. 1, pp. 142_152.

Popova, A., Kirschner, P. A. & Joiner, R. (2014) 'Effects of primer podcasts on stimulating learning from lectures: how do students engage?', *British Journal of Educational Technology*, vol. 45, no. 2, pp. 330_339.

Regan, J.-A., Middleton, A., Beattie, C. & Sextone, R. (2011) 'Scenario-based evaluation of an ethical framework for the use of digital media in learning and teaching', *Journal of Pedagogic Development*, vol. 1, no. 2, pp. 39_48.

Rotheram, B. (2007) 'Using an MP3 recorder to give feedback on student assignments', *Educational Developments*, vol. 8, no. 2, pp. 7_10.

Rothwell, L. (2008) 'Podcasts and collaborative learning', in *Podcasting for Learning in Universities*, eds. G. Salmon & P. Edirisingha, Open University Press, Maidenhead, pp. 121_131.

Rushton, D., Wilmot, N., Middleton, A. & Warwick, S. (2015) 'Using social video to capture reflective voices', in *Smart Learning: Teaching and Learning with Smartphones and Tablets in Post-Compulsory Education*, ed. A. Middleton, MELSIG & Sheffield Hallam University, Sheffield, UK.

Shulman, L. S. (2005) 'Signature pedagogies in the professions', *Daedilus Summer*, vol. 134, no. 3, pp. 52_59.

Sipple, S. (2007) 'Ideas in practice: developmental writers' attitudes toward audio and written feedback', *Journal of Developmental Education*, vol. 30, no. 3, pp. 22_31.

Smith, C. M. & Sodano, T. M. (2011) 'Integrating lecture capture as a teaching strategy to improve student presentation skills through self-assessment', *Active Learning in Higher Education*, vol. 12, no. 3, pp. 151_162.

Sutton-Brady, C., *et al*., (2009) 'The value of using short-format podcasts to enhance learning and teaching', *ALT-J*, vol. 17, no. 3, pp. 219_232.

Walls, S. M., *et al*., (2010) 'Podcasting in education: are students as ready and eager as we think they are?', *Computers & Education*, vol. 54, pp. 371_378.

Waring, M. & Evans, C. (2015) Understanding Pedagogy: Developing a Critical Approach to Teaching and Learning, Routledge, Abingdon.

Zhang, L. (2015) *The Malleability of Intellectual Styles*, Cambridge University Press, New York.

In-between spaces [C1]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). In-between spaces. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 55 - 71). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

This chapter argues that a learner-centred teaching philosophy can be enhanced by appreciating the significance of the third spaces (Gutiérrez *et al.*, 1999) which form the diegetic glue of a learner's spatial ecosystem. Socially and spatially, learning is an outcome of a student's experience in their unique 'identityscape' (Hancock & Spicer, 2011). Concepts, such as third *place* (Oldenburg, 1989) and liminality (Gennep, 1909/1960), are considered useful for understanding learning as being ritualist and situated between formal spaces such as the classroom, home and work. Learning is positioned as an outcome of a student's crossing of boundaries: as students encounter material, digital, and social spaces, they are involved in the making of their own learning place, wittingly or not.

Three case studies in this chapter highlight the value of co-operative and connective spaces. In two, *Facebook* is highlighted as a negotiated third space which sits between the formal requirements a student experiences and the non-formal world over which they have more control. The third study considers the design of contemporary learning spaces and the university's role as provider of informal space and the inherent dilemmas of creating informality.

An idea of hybrid learning studio emerges from this, characterised by the hybridity of the social, material and technical factors forming this melange. Co-operation also emerges as a form of learning cohabitation in which 'working alongside' (Harrop & Turpin, 2013) or studying in 'refuges' and 'vistas' (Dosen & Ostwald, 2013) exist in relation to a student's formal learning experiences. Ideas about 'down time', transition, dwelling, translocation, emplacement and displacement create a picture of learning as a personal, social and essentially co-operative experience. Spatially, adjacency and interstitiality point to the significance of proximal spaces in which connections between people, phenomena, spaces, and ideas can all be made.

[293]

A student learns across boundaries. Class, online, home, work and so many other places connect as spatial points in an expansive landscape. Campus design must play its part in integrating this multidimensional modality by incorporating a student's individual and social needs for formal and nonformal engagement (SCHOMS *et al.*, 2016).

This chapter considers ways of looking at spaces, places and boundaries, and the benefit for students to create a stronger sense of their experiential 'identityscape' (Hancock & Spicer, 2011). It considers the concepts of Third Space, Third Place, liminality, boundary space, vernacular spaces, and learning networks, and concludes that in-between spaces that connect one experience to another are a critical dimension of the concept of hybrid learning space.

The three case studies here, in their different ways, highlight the value of these connecting spaces.

Case study: Facebook as an extension learning space

Subjects: David Clarke and Julie Gillin

> Julie Gillin, who teaches on the MA International Journalism course, is the nominal 'moderator' of a *Facebook* Group used to support David Clarke's Media Law module, part of the BA Journalism course at Sheffield Hallam University. This case study explores their initial interest in, and subsequent reflections on, using *Facebook* to develop a scaffolded apprenticeship model of education.
>
> Julie has studied changes to the way young journalists enter the profession. Where once most would-be journalists began as trainees on a local newspaper, most now enter the profession as graduates (Niblock, 2013; Conboy, 2013). A working knowledge of media law is an essential skill for journalists, but it is challenging to teach, requiring an understanding of the law and how it is applied in practice.
>
> While the institutional Blackboard virtual learning environment remains the essential space for providing need-to-know information, *Facebook* appeared to offer a way to make the subject highly engaging. Julie explains, 'the journalism team currently have *Facebook* Groups for modules where they are used as a platform to present the journalism. Groups, rather than Pages were chosen as they offer greater privacy options.'

Students use these groups to publish their work and to communicate with each other.

Using Blackboard simply as a repository of key information allowed the course to use *Facebook* as a more 'immediate' space.

Dave invited everyone from within his module to join the Media Law *Facebook* Group to share stories from the news. About 75 students are registered, including some alumni who were encouraged to stay part of the group to share their experience of court reporting with current students. This connection beyond the formal parameters of the course created an interactive channel potentially benefitting current students and practising alumni.

The *Facebook* Group extended the contact Dave has with his students beyond the weekly class. 'We were not short of material. That was the amazing thing. There was lots going on which we knew was of interest.' At that time, in addition to the Charlie Hebdo attack in Paris, there were the reports on the trials of *News of the World* journalists and an incident where two female students were subject to sexual harassment in court. These events impacted on students as journalism students and *Facebook* became a place for reassurance and discussion about being a journalist in a difficult professional world.

Dave was in Paris at the time of the Charlie Hebdo attack and Julie realised they were well positioned to model practice around a current news event of international importance. 'I was observing what was happening as a journalist. I felt part of what happened [professionally, and] thought our students are probably doing the same and if they're not, I want them to.'

They decided to encourage their students to say 'Je suis Charlie' on social media to show solidarity. 'It was a lightbulb moment. We thought, actually, what we have got here is a community of practice. You might be students and we might be more experienced, but "We are journalists. We're in this together".'

Possibilities and dilemnas in new in-between spaces

Julie explains that, while the curriculum runs formally following normal academic conventions and roles, the profession has a living identity in the University and *Facebook* creates a space

which is neither ‘the university’ nor ‘the newsroom’. It is a space between, a Third Space (Gutiérrez *et al.*, 1999) or boundary space, in which the professional identity is fostered. It is different to other learning space used by the academics and the students: different in location, roles and attitudes. This is complicated further because there are three essential identities at play: the academic, the student, and the journalist.

Julie notes that there is an unspoken acknowledgement in this space that stepping over the professional line can be alright, because as a professional you know that line exists. For example, the use of gallows humour can reinforce professional tolerance and identity. It can develop a subtle bonding through an irreverent release of tension and can create a sense of camaraderie that in other contexts would be inappropriate.

Community members ‘opt in’ to the *Facebook* space. In contrast, she says, ‘We are more careful in the classroom where we don’t know each other so well and need to be aware of cultural and personal sensibilities.’ Spaces like Blackboard or the classroom have an academic integrity that needs to be guarded. A *Facebook* Group established and supported by ‘tutor-journalists’ is a boundary space where the ‘apprentice-journalist’ can begin to feel some adrenaline and develop some professional instinct.

Dave notes how levels of active engagement with the *Facebook* Group fluctuate from one cohort to the next. While *Facebook* creates a new experiential space in which roles are less delineated, Julie is concerned that the information shared there, while seen by the students, is separated from their academic context and discourse. It is not enough that the space mediates access to new content, the academic value of the content needs to be elicited and made explicit. ‘We don’t know what they do with it … and, as with recent cohorts, [there is] little or no interaction. Some fantastic resources are posted on *Facebook* rather than Blackboard, but the curation is not good, so these are not referred to again with future cohorts as, at least, may be the case with Blackboard.’

The *Facebook* Group is valuable as a live and authentic boundary space; however, the existence of the space is not enough to consistently motivate the students to critically engage with it as users and producers of content. Dave and Julie

continue to explore how to make it work well alongside their normal academic practice.

Case study: Using Facebook Groups for virtual Peer Assisted Learning

Subjects: Sarah Honeychurch and Shazia Ahmed

Peer Assisted Learning (PAL) involves students working together to support each other informally (Thomas, 2012). PAL study groups can have diverse purposes including supporting transition through university, clarifying conceptual knowledge, providing assistance with feedback, developing learning skills, and offering placement mentoring.

Sarah Honeychurch and Shazia Ahmed had tried over several years to provide face-to-face PAL sessions to support the development of academic literacies at the University of Glasgow. Their attempts to bring students together voluntarily in the same place at the same time were disappointing. 'Traditionally PAL sessions were badly attended because of either timetabling problems or the fact that a large proportion of our students commute.' They felt a more responsive just-in-time approach was needed and drew upon their personal experiences of using *Facebook* Groups to develop vPALs.

Facebook Groups for peer support

Sarah and Shazia say *Facebook Groups* work well as an informal learning environment because the students are already there. As asynchronous spaces, there are no timetabling problems and students can access help when they need it. Posts, which are available to all group members, persist long after the online conversations have happened, and they are more inclusive than face-to-face sessions,

> *Shyer students can 'hide' behind a screen and non-native speakers can take the time to process posts and compose their replies.*

They began by setting up *Facebook Groups* for two Level 1 courses: Mathematics and Computing Science, and have gone on to initiate other groups. Sarah says their moderation role involves them welcoming students, 'letting them know who we are and how to find us', but the activity mostly involves the students themselves.

All new students receive an email about how they can join the vPALs scheme with their 'Welcome to Uni' message. From an

initial welcome group, students can navigate to subject specific groups. Students are reminded about vPALs when they access other support services. For example, a Maths Advisor sends targeted emails at intervals throughout the year and will also recommend the vPALs groups to the students she meets.

Having run the groups for several years, they say vPAL groups provide a nonthreatening space for dialogue between classmates, senior students and support staff.

At the end of each year, as they set up new groups for each new intake, the existing ones are rolled over and renamed at the request of the student group members.

Peer-led

> *We have a hands-off policy and always wait to see if other students will respond before we reply to posts. Occasionally we intervene to give information, pin posts for students and, very occasionally, moderate the tone. Usually students are good at doing that for themselves though.*

One of the dangers of PAL schemes is that student mentors can assume a teaching persona and can unwittingly misdirect other students. Sarah and Shazia select students they know to be helpful and who will encourage effective responses by liking posts or thanking students in the thread, or by talking to peers face-to-face.

> *The senior students set the tone by being friendly and helpful and others follow suit. There's also a good deal of collaboration to work on past papers and tricky questions in Maths and Comp Sci. I'd say part altruism, part driven by the network, and part a spirit of collaboration that is possibly subject driven.*

I ask how they cope with 40 groups in the always-on, boundless, open-ended flow of *Facebook*? Sarah and Shazia spend about five minutes a day looking for unanswered questions amongst the 40 groups they have established.

> *We keep notifications switched on so we can quickly monitor which [groups] are busy. Because we have senior students monitoring the junior groups there's not much for us to do.*

> Sarah and Shazia have seen an increase in the volume and depth of academic discussion and feel it is an outcome of the PAL communities.
>
> The vPALs space offers many benefits as a student-supported space. While students cannot be forced to take part in the vPAL groups, it fosters a responsive and collaborative culture and is always available, even during holidays.

4.1 Reflecting on Facebook as a timely Third Space

In these two case studies, *Facebook* affords a new type of negotiated learning space in which the space suggests new ways of being academic. The protocols for engagement in each are as much inherited from other experiences of social media as they are from academic conventions and in this way the *Facebook Groups* set an expectation for learner self-direction, demanding different learning attitudes, identities and tutor-student relationships. In this sense, the use of *Facebook* creates archetypal Third Space, being neither formal nor informal. Engagement, when it happens, is deliberate and non-formal. The spaces are full of academic potential, but as we saw with the healthcare students in the previous chapter, it would be difficult to imagine how the quality of learning in these Third Spaces could be derived from a tutor directed space.

It is up to each individual student to determine the value of engaging through the *Facebook Groups*, but it is a familiar and accessible space for most and so becoming involved is relatively easy for them.

Facebook Groups are up-to-date and 'always on', and allow the learner to access what they need just-in-time. They contrast markedly with how students experience the institutional VLE which is generally accessed for specific purposes (Pearce, 2014; Maloney, 2007) and cannot be easily compared to equivalent physical spaces or face-to-face services.

Stirling (2014) identifies the *Facebook Group* as a bounded space, but one that 'flows freely between the social and the academic worlds of the students.' This makes it preferable as an informal and supportive environment capable of embodying self-initiated study groups or spontaneous lecture backchannels (*ibid*). They are flexible and accessible spaces, and can be open to anyone or

controlled by invitation, with all posts showing up in each person's Newsfeed, or made secret and requiring invitations to be sent.

4.2 Joined-up thinking for the design of joined-up space

An holistic, joined up and leaderful appreciation of learning space and its development amongst managers, academics and professional services staff is necessary if a university is to create visionary learning spaces. This can be achieved through the co-development of sound design principles. The following case study explores this need to co-ordinate a collective expertise and how multidimensional new build and refurbishment projects can be managed in the interests of learning and teaching.

Case study: The role of 'learning architect'

Subject: René Meijer

> René Meijer describes his mediational role at the University of Sheffield as 'learning architect'. It involves researching, identifying, supporting, challenging, interpreting and influencing the strategic and operational decisions necessary for creating spaces that foster learning.
>
> René was involved with the development of his university's Diamond building which opened in 2016. Inside, it is characterised by a learning logic. About a third is dedicated to specialist Engineering facilities, a third to non-formal learning space, and a third to pool teaching.
>
> The variety of spaces is notable with some being quite intimate, even in such a large facility. René explains that intimate spaces afford a sense of secure comfort and immersion for student study, supporting a person's need to be hidden whilst being aware of their environment. Elsewhere he points to how 'working alongside' for friends, understood as more than just peers, has been accommodated. The Diamond feels spacious and transparent, having fully glazed walls in much of its interior, but its design manages the tension between personal, social and functional learning space.
>
> Developments provide a chance to think differently about space. However, learning space 'new builds' and 'refurbs' are rare and costly opportunities, developed according to a relentless schedule. René explains imagining the unknown is difficult: can the teacher interpret learning needs and teaching possibilities

spatially? Do students know enough about university learning and their disciplinary signature demands? Is it reasonable to expect estates managers to have a progressive understanding of innovative pedagogies and future learning trends? Can senior managers grasp the potential of uncharted futures to commit to wholesale change? These questions, and many others, require a mediational role.

René says,

> *I work with pretty much everyone! A lot of it is talking. It's about bringing people together. Much of the challenge that we face is about getting people to communicate … My role is often about introducing people into a conversation … or introducing questions into a conversation that haven't been asked.*

He runs a 'sandpit' prototyping space to bridge the language barrier that characterises learning space development. Prototyping mediates informed complex thinking about learning space. 'If you wheel some example furniture into a space or you mock up the AV installation on the wall, and you bring people in and say, 'How's this for you?', everyone can have a sensible discussion.'

During the planning for the Diamond, René created a sandpit space in a classroom due for refurbishment. 'We cleared the furniture out early and we put our potential furniture choices in there.' His methods reflect scenario-based learning where the complexity is made real. Academics, library and IT staff, cleaning staff, the Students Union and others could come together to evaluate options for the Diamond. More than this, they found their way into valuable rich discussions. Without this collective approach AV staff, for example, could have only assumed what was needed when making decisions by using their technical and management knowledge with little understanding of progressive pedagogy or the implication of their decisions for others. Through prototyping, academics can discuss how they teach and explore possibilities with colleagues from Estates, AV, Technology-Enhanced Learning, and so forth. Each grows their understanding of the bigger picture, inspiring each other through facilitated discussions. Ultimately, their individual and collective decisions develop coherence.

René explains that academics are often unaware of the relationship of space to teaching and learning, and the consequent possibilities for academic innovation. They may have a lot to say about the classrooms they have used, but are often unaware of how the space adjacent to their classroom can be developed to enhance their students' experience. Similarly, Estates professionals often assume academics have a thorough knowledge about learning and teaching, not understanding their range of contexts and signature nuances, and different levels of interest. When it comes to learning space, academics don't know what they don't know, and this applies to other stakeholders too. Estates officers, academics, students, information specialists, digital infrastructure managers, and many others, need to be able to draw upon someone who has a wide knowledge and experience of progressive teaching, learning habits, and the potential affordances of the physical and digital space.

René argues that universities need to develop a more holistic conception of student experience, but are inhibited by their inherited conceptualisations and systems, which are incapable of supporting experience holistically. This leads to pragmatism and dissatisfying fragmented student experiences. He notes the inadequacy of timetabling systems for example, 'I can't make sure that when I design my module the type of space that I need is available … So often I will design to the lowest common denominator.'

The learning architect role is concerned with hybridity and learning contiguity. But this is impossible to achieve without an integrated development model.

Finally, René notes how the digital has become part of the physical lived space. 'They were different planes of existence almost ...they've become an extension of one another . … Our presence and our environment is always physical and always virtual,' he says, and this requires a wholesale conceptual rethink leading to a conception of hybrid learning paradigm.

4.3 Reflecting on place, timetabling and hybridity as an outcome of joined up thinking

Hybrid learning space needs to be managed. To do this, universities need to create an organisational learning logic that reaches beyond curriculum delivery to independent and lifewide learning. As much as universities set expectations

for independent learning, our learning spaces must accommodate the range of intimate and social places our students need to establish their belonging and commitment to self-directed study alongside peers and friends.

Academic innovation is inhibited by our collective inability to conceive of and manage operational spaces differently. While binary thinking and fixed parameters create a manageable frame of reference for innovative academic practitioners at the ‘chalk-face’, university systems and university thinking feel inflexible and out of touch with the space as it is lived. A real future-looking transformative vision of space, such as that proposed by a hybrid learning paradigm, requires co-ordination to challenge silo-thinking and harness a collective expertise (see Chapter 1 Box 1.3, Stakeholders in learning space development).

For example, short problem-setting briefings and plenary discussions have different spatial and temporal requirements to those usually accommodated by timetabling systems. Inflexible systems can result in academics over-booking spaces to create options as teaching unfolds. Progressive flexible pedagogies are not easy to systematise because requirements can change within session or develop throughout a series of sessions. Better quality learning hubs, Information Commons and learning studios begin to address this but remain awkward to schedule reliably. Timetabling systems are necessary, but are generally accepted as being inadequate in their current form. How can technicians, academics, senior managers, students and others co-operate to invent a system that provides facilities flexibly, just-in-time, on and off-line (incorporating all blended options between) for academic and student-led learning? While finding an answer could revolutionise our use of learning spaces, it is unlikely that an off-the-shelf timetabling system will deliver what is needed if we cannot specify it. To effectively manage the operation of future hybrid learning spaces we need to develop our collective articulation of such complex problems. Using gamification, prototyping and simulation methods and tools may help us to imagine how this can be achieved.

4. 4 A sense of being between and within

The ideas in these case studies bring the value of student presence to the fore in diverse situations and how this can be facilitated through roles that, in some respect, also feel 'in-between'.

Malcolm *et al.* (2003) argue that the attributes of informality and formality are co-present, to differing degrees, in all learning situations. Together they engender student self-identity which is informed by inherent spatial attributes and associated user behaviours. Learning identity fluctuates to reflect different situations.

Reactive learning

Reactive learning is near-spontaneous and unplanned (Eraut, 2000). An effective reactive space, therefore, is one that accommodates action and interaction, co-operation, feedback, and the sharing of repertoires. It is enculturating and gives its participants the opportunity to observe and practice behaviours reflecting cultural norms (Brown *et al.*, 1989). As Gillin and Clarke found, authentic space incorporates a tolerance that can be flexed to enhance identity building through trustful, even irreverent, exchange and joint enterprise. Steele and Jones-Devitt observed how their students created a meaningful café and *Facebook* space in which they formed and asserted a strong co-learning identity. Similarly, open social space designed to create opportunities for discussion (see Sue Beckingham's case study, no. 14), debating or performance, or makerspaces in which learning happens through collaboration, mutual support or simply working alongside (Harrop & Turpin, 2013), for example, are not directive, but tacitly accommodate and challenge ways of being.

Reactive learning can be fostered by structures: informal peer mentoring schemes, autonomous learning sets, student societies, and the use of *Facebook Groups*.

As well as the Gillin and Clarke, and the Honeychurch and Ahmed examples (case studies no. 4 and 5), learning serendipity can be fostered by suggesting the value of interaction, as in the examples of 'The Grass' and 'The Hill' interior landscapes described in the Shaun Hides case study (no. 11).

Implicit learning

Implicit learning gives rise to tacit knowledge (Eraut, 2000), developing learning without being aware. Learning your native language or how to walk are examples of this. Developing professional dispositions is another example. In social settings, implicit learning contributes to the nurturing of common identities and is critical to learning in higher education in which knowledge develops depth by being culturally situated (Brown *et al.*, 1989). Implicit learning involves unplanned action and the development of associations. At its simplest, two chairs in a waiting room create learning potential, and that increases when they are turned to face each other. A café positioned at a crossing point is another example.

Imaginative space design leads to 'sticky' behaviours that encourage learners to congregate of their own accord, forming common homely spaces (Oldenburg, 1989). This can be enhanced by reviewing policies and working behaviours that inadvertently or unnecessarily create barriers to free movement and exchange. For example, a sense of home can be enhanced by introducing amenities into a space, increasing access, considering inclusivity, incorporating digital signage for the display of course *Twitter* feeds, creating meeting points, or creating seating space conducive to buddying or simply developing friendships.

Implicit learning space design allows for the routinised needs and actions of its users, such as making phone calls to check childcare arrangements (see case study no. 2, Noel Rogers), using perching space between lectures, having somewhere to collect thoughts, review notes, or check academic or social arrangements with friends.

Third Space

Third Space describes a significant space in addition and in relation to two obviously dominant spaces, such as school and home. Pahl and Rowsell (2005), for example, use Third Space to establish a legitimate body of appropriate reading matter that bridges both home and school in their work on literacy. Gutiérrez *et al.* (1999, p. 289) describe Third Space as a collective and vibrant learning space. They identify its hybrid nature in which 'cultural and

linguistic practices, histories, and epistemologies collide', and are negotiated, 'when people attempt to make sense of one's identity in relation to prevailing notions of self and cultural practices'. In their case of after-school clubs in Mexican non-dominant communities, accepted ideas are contested and replaced with more meaningful polycontexual, multivoiced and multiscripted ideas of learning and knowledge.

Cronin (2014) highlights the possibilities of open online learning networks that integrate both formal and informal learning, which she describes as Third Spaces. She is concerned that some educators in higher education are slow to engage their students with networked open education, and discusses how remaining steadfastly bound within institutional space is disadvantaging students.

Third Place

Oldenburg (1989) also observes that without shared places we can have no sense of common identity and that we become strangers in strange places. For higher education managers, this should resonate with discourses about student alienation and retention. He defines Third Places as being neitherOldenburg (1989) also observes that without shared places we can have no sense of common identity and that we become strangers in strange places. For higher education managers, this should resonate with discourses about student alienation and retention. He defines Third Places as being neither work, nor home, but where people come together to socialise. Habits and rituals form around meeting points such as bars, coffee shops and clubs.

Box 14. Characteristics of Third Places (Oldenburg, 1989)

* **Neutral ground** – where individuals are free to come and go with little obligation;
* **Leveller** – rank and status are mostly left at the door and participation is open to all;
* **Conversation** – the main mode of participation is conversation, especially noted for its playfulness and wit;
* **Accessibility and accommodation** – the place is easy to access and use;
* **Regulars** – the narrative and identity of the place is sustained by a core group of regulars;
* **Low profile** – the space is unpretentious and homely;

* **A home from home** – exhibiting traits of rootedness, feelings of possession, spiritual regeneration, feelings of being at ease, warm (Seamon, 1979).

Third Place qualities are evident in many of the book's case studies and describe a richness of experience that is central to case study no. 12, Pol Nugent's example of learning in pubs and Sue Beckingham's tweetchat space (case study no. 14).

Learning space affects identity, intimacy, being at ease, confidence and self-efficacy, and resonates with diffuse and complex ideas of 'home' as a condition that 'integrates memories and images, desires and fears, the past and the present' through the 'rituals, personal rhythms and routines of everyday life' (Pallasmaa, 1992, n.p.). Learning space design needs to understand learning as a socio-cultural experience, drawing more upon the plaza and less on the factory.

Transient Third Places can be observed in the readiness of individuals to adopt and adapt spaces to suit their immediate needs. Contemplative, reflective and immersive behaviours can sit alongside the hubbub of noisy and miscellaneous activity (Shortt, 2014). On campus, we observe how individuals and groups make do by appropriating ledges and edges, walls and lawns. The experience and habits of physical and digital blended places create a dissonance in which ideas of home and place, contemplation and digital connection seem to jar (Memarovic *et al.*, 2014), but which must be accommodated.

Facebook apps demonstrate their connection to the concept of Third Place, being a locus for playfulness (Rao, 2008), and social media communities can reflect many of the qualities of Third Place: a neutral ground in which the tone is established by a core group, where there is an equity in conversation and purpose, and where the space is accessible as a home from home.

Liminality

Originated by Gennep (1909/1960), the concept of liminality refers to the rites of passage which mark an individual's transition from one status to another within a given society. Gennep identified three phases of liminality found in

rituals: separation, transition (the interstitial state) and incorporation, with each junction being a cause for liminal passage. Subsequently the phenomenon of passage has been observed in other social contexts and 'liminality' has been used metaphorically. In education, ideas of ritual, passage and transition are common, used in relation to knowledge (Meyer & Land, 2003), identity and boundary space.

Boundary space

Boundaries are not 'physical, symbolic or imaginary lines but lived conditions where the "inside/outside" are constantly negotiated, emergent and blurred' (Daskalaki *et al.*, 2012, p. 26) The word 'boundaries', in this sense, describes physical, cognitive and social thresholds as catalysts for learning as they are crossed. Daskalaki *et al.* (2012) discuss liminality and translocation in their study of workers crossing continents, being particularly concerned with displacement and emplacement across space and time. They argue that place, identity and mobility are interlinked phenomena that together create complex embodied experiences. This connects with our exploration of learning space and the value and challenges of psychosocial boundaries and crossing points.

Displacement is useful for thinking about the absence of course home. Emplacement, by contrast, describes a sense of common identity and place. Between these is the tension of being in flux, anxious, curious and uncertain. Ideas of translocation, displacement and emplacement are therefore useful for considering learning flux as it is experienced by the learner continually negotiating knowledge and identity across different situations. This is evident in several case studies in this book in which personal, domestic, professional and academic identities encounter contrasting learning contexts. These studies evidence the polycontextual and fluid nature of learning experience.

Connected learning and vernacular space

Boundaries are not 'physical, symbolic or imaginary lines but lived conditions where the "inside/outside" are constantly negotiated, emergent and blurred' (Daskalaki *et al.*, 2012, p. 26) The word 'boundaries', in this sense, describes physical, cognitive and social thresholds as catalysts for learning as they are crossed. Daskalaki *et al.* (2012) discuss liminality and translocation in their

study of workers crossing continents, being particularly concerned with displacement and emplacement across space and time. They argue that place, identity and mobility are interlinked phenomena that together create complex embodied experiences. This connects with our exploration of learning space and the value and challenges of psychosocial boundaries and crossing points.

Displacement is useful for thinking about the absence of course home. Emplacement, by contrast, describes a sense of common identity and place. Between these is the tension of being in flux, anxious, curious and uncertain. Ideas of translocation, displacement and emplacement are therefore useful for considering learning flux as it is experienced by the learner continually negotiating knowledge and identity across different situations. This is evident in several case studies in this book in which personal, domestic, professional and academic identities encounter contrasting learning contexts. These studies evidence the polycontextual and fluid nature of learning experience.

Connected learning and vernacular space

Motivation is high in 'social and collaborative contexts where individuals work together, share knowledge, and engage in joint inquiry' and where 'there is little need to assess and mark individual knowledge and expertise' (Hutchins, 1996). Learning and cognition 'in the wild' (see Ollie Jones and Terese Bird, case study no. 21) can happen in situations where they are characterised by a sense of collective achievement involving socially negotiated goals. This is also found in Ito *et al.*'s (2013) concept of Connected Learning in which 'everyday learning' is resilient by engagement with purposeful activities or goals that happen beyond formal bounds and where learning is not explicitly educational.

The concept of vernacular literacies (Hamilton, 2000), situated in a study of reading literacies, explains the value of learning beyond the dominant, formal context, with practices learned informally through 'everyday perplexities and curiosities' (Hamilton, 2000, p. 8). Hamilton identifies vernacular practices as being related to reified dominant literacies, but self-generated and socially regulated. Broadening the concept of literacy beyond reading, vernacular literacies are concerned with getting 'other' things done and part of a hybrid 'Do-

It-Yourself' culture. Vernacular literacies can be summarised as being concerned with:

- embodied experiential and active knowing;
- symbolic propositional and conceptual knowing;
- embedded procedural knowing;
- encultured shared knowing.

Vernacular literacies are evident in Nugent's Philosophy in Pubs case study (no. 12), and the case studies on *Facebook Groups*, in which autonomous learning networks operate in borderland spaces.

4.5 In-between and adjacent space

Thinking about interstitiality and adjacent space is useful for both learning design and a holistic outside of the 'classroom' box view of learning space.

Interstitial space is about the connection between spaces: for example, how the classroom idea connects with the café idea; how home connects with work and with study; how the digital connects with the physical. It creates both frisson and teaching challenge. It reveals opportunities for engagement and the potential that one space gives to another. It is evident in Carter's case study (no. 10), in which there is a need to manage engagement in pre-class learning to inform in-class, and post-class activities in the context of a flipped learning strategy (Bermann & Sams, 2012). Interstitial space reflects the liminal fusion in the blended learning space. It describes a spatial interactivity inherent in the use of adjacent spaces and amenities for teaching.

The idea of adjacent learning space, as a dimension of hybrid learning space, is about the multiplied value of contiguous formal and non-formal learning spaces, and is found in the ideas of in-between space, Third Space, Third Place, interstitiality and liminality.

Box 15. Examples of adjacent space

- The learning moments with peers before or following class;
- The cognitive space created on a train journey between home and university used by a student to review conversations or notes;
- The tweet exchange between peers that sheds light on a complex problem;
- The catch-up coffee between part-time students prior to a lecture when they compare their progress;

- The field excursion as an in-between space.

Thinking about non-formal and adjacent space is important because tutors need to consider learning that happens beyond formal contact and students need to learn how to learn independently and notice spaces, habits and opportunities that work for them.

Down time

Shortt's study of workplaces (2014) and her notion of the 'transitory dwelling space', 'in-between space' and 'everywhere' spaces has resonance with education. Her study observes the hairdresser snatching a quick break sitting on the fire escape. We are told about the stealthy break habitually taken away from the intensity of working in public and how important it is that the worker finds some contemplative quiet time. Signalling the value of down time through the design of enclosed 'refuges' and 'vistas' (Dosen & Ostwald, 2013) is equally applicable to the learner for whom a day on campus can be arduous, intense and emotionally draining. Favourite seats, views and hidey holes can help students to form reassuring and healthy learning habits, and the same is true for groups. The ritual of the collective 'deep breath' allows the student to make the necessary psychological shift into study from work, home, off-line space or the car journey into college (see case study no. 1: Steele and Jones-Devitt; case study no. 14, Sue Beckingham; and case study no. 15, Sarah Smith).

Hybridity and learning through networks

Hybridity embraces the polycontextual nature of learning (Gutiérrez *et al.*, 1999) challenging the manager's drive to make complex spaces and experiences straightforward and convenient.

Our formal learning spaces mostly reflect a hierarchical learning philosophy, with non-formal spaces resembling feudal unstructured patterns of association (Fig. 4.1, after Cross, 2007). Non-formal learning designs can be developed to incorporate the connectivity and resilience evident in networked learning (Jones, 2004b).

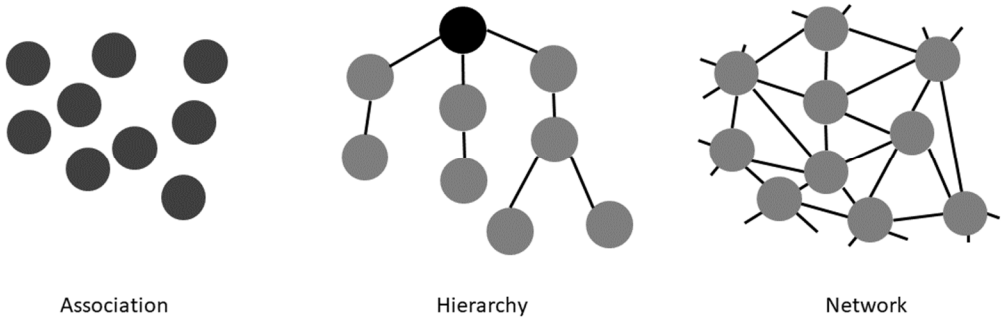


Figure 4.1. The resilience of networked structures

Learning networks

Jones (2004a) defines networked learning as 'learning in which information and communication technology is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources'. The network metaphor emerged from computer networking and was subsequently appropriated to describe the learning behaviours supported by networks. Jones identifies the significance of learning networks to higher education, allowing educators to reassess learning theories which promote the value of communities and communities of practice (Jones, 2004b). Subsequently, Carvalho and Goodyear (2014, p. 9) say that networked learning, 'implies a degree of openness and flux that "community" may not capture. It implies interactions between people who then interact with others.' Unlike communities, networks maintain an active sense of connectivity, being established around people, objects or messages. Jones (2004a) cites Castells (2001), who emphasises how romantic ideas of collaboration and community (Fox, 2002) stand in sharp contrast to 'networked individualism', based on the capacity of a nodal design. Networked individualism goes some way to explain how the highly personal experience of learning through social media co-exists within its dominant socially driven context.

Carvalho and Goodyear (2014, p. 11) explain that 'networked learning cannot be designed – it can be designed for', and this suggests the capacity of networked learning to be a non-formal reactive and implicit space. This continuous potential and defining quality of networked interaction shows

networks to be innately productive, foregrounding creation rather than consumption. This alone establishes the networked learning space in a new dynamic and generative paradigm in which tacit and rendered knowledge is produced, and perhaps more significantly, in which emergent and collective ideas of self are formed.

Jones (2004b) explains how networks grow through the addition of new nodes to existing nodes, with some networks being characterised by clustering. Networks often thrive due to their weak ties, which can more easily bridge between network clusters, in contrast to strong ties which tend to promote inward looking behaviours.

Networked learning is further explored later through the concept of Personal Learning Networks, which Richardson and Mancabelli (2011) define as ‘a set of connections to people and resources both offline and online who enrich learning’.

Connected Learning

Ito *et al.*’s (2013) idea of Connected Learning evokes hybridity and, to some degree, Connectivist thinking (Siemens, 2005). The idea explores learning as found in the act of making and sharing, often led by autonomous individuals and groups working alongside each other co- operatively; in collaborative endeavours; or through self-determined learning. Its core principles are: ‘shared purpose across age boundaries, opportunities for production, and an openly networked environment that allows for sharing and publicity across settings’ (Siemens, 2005, p. 73). Connected Learning uses non-formal social spaces and is found, not only in disadvantaged communities, but in lifelong learning situations in which people inspire each other, for example through co- working, hackerspaces or ‘meet up’ groups (Bilandzic & Foth, 2017).

In the US, Connected Learning has a strong equity agenda that responds to a growing social divide. Its aim is to confront a narrowing curriculum diminished, for example, by the exclusive extra-curriculum opportunities taken by more affluent families. It echoes vernacular literacies and builds upon Dewey’s principles of learning through experimentation (Dewey, 1916) by deploying new media to advance learning through community initiatives.

Connected Learning is interest-driven and exploits familiar digital media and access to multifunctional screens which integrate voice and text communication, image and video, games, photography, music, television, print and apps. Its ethos complements the discourse around online Personal Learning Networks (Cronin *et al.*, 2016; Cronin, 2014; Blaschke, 2014; Stewart, 2013; Couros, 2010) and Open Education (Wiley, 2014) which have affinities with its disruptive rationale.

Pedagogically, in Connected Learning, Ito *et al.* (2013, p. 35) say,

> *Students take the lead in designing, discovering, and evaluating possible solutions. Students provide each other with ongoing feedback about each other's ideas and work styles. They engage in delicate, and often difficult, negotiations over what their team should try next, who should do what, and who can tell or ask someone else to do something. While failure is commonplace, and while conflicts sometimes arise, educators resist intervening extensively. In general, students are active and highly engaged, and the classroom is often vibrant and boisterous.*

The implication of Connected Learning is that, properly motivated, students can negotiate their own learning, self-regulate, and find the spaces they need to sustain their work.

4.6 'Other' spaces

This chapter has highlighted conceptualisations of the 'other' in in-between learning spaces. It has discussed how learning space is defined by the student's intrinsic experience and not only by its functional conception and management. More specifically, it has identified the need to consider psychosocial ideas of space for supporting the student's growing sense of self.

Questions for reflection and discussion

1. Organisationally, our attention and effort as academic or professional service staff prioritises the formal design and delivery of learning. Can we take a more holistic view of the learner experience? If so, how can we do this?
2. The concept of Third Place describes spaces that afford informality, of being at ease, and homeliness. Do you recognise such spaces in, or near to, your own practice? What is their value to you? How can you, your colleagues and your students do more to make these places for fostering learning and belonging at university?

Being social: the connected learning space [C2]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Being social: the connected learning space. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 122 - 141). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

The chapter presents a model of augmented learning space in which digital media overlay formal, non-formal and lifewide learning experiences. The chapter's case studies consider sites of co-operative networked learning. Three examine social media as a learning space, while the fourth demonstrates similar networked authorship behaviours, albeit independent of technological mediation.

The chapter develops ideas of studio through consideration of the co-creation of knowledge in participant-defined intersecting spaces; forms of learner-generated context (Luckin *et al.*, 2011). Boundary crossing behaviours are evident in the examination of tweetchats in which participants maintain multiple identities through 'multichronous' acts which involve synchronous, asynchronous and near-synchronous exchanges. These acts support the idea of polycontextuality, introduced in the previous chapter, with implications for situatedness.

The studies describe communal acts of social media posting as strategic acts of networked authorship and learning which, metaphorically, establish studio-based learning as being collective acts of hanging work-in-progress on a public wall for the benefit of everyone.

The chapter proposes that effective complex learning spaces demonstrate explicit and tacit forms of co-regulation. Similarly, social media when used as a place for learning repositions what is meant by friendship by aligning it to co-regulated non-formal and self-determined acts.

All case studies highlight the value of purposeful, loosely structured, and conversation learning. Digital backchannels and 'multilogues' (Megele, 2014b) establish a sense of conversational space. Such spaces accommodate and value diversity by supporting highly driven MKO actants (Vygotsky's 'more knowledgeable others', 1978) alongside those who prefer to lurk. Studio is defined in terms of personal learning networks (PLN); sites of distributed expertise, collaborative and facilitated learning, networked learners, and openness (Stewart, 2013).

Connectivity across, between and beyond formal learning spaces to the mutual interest and benefit of communities, helps to redefine situated learning and the proposition for developing the notion of hybrid learning studio. [300]

The case studies in this chapter explore the relationship of social media to learning and show how it creates an augmented networked learning experience which extends across, permeates and consequently disrupts understanding of learning in more traditional formal and non-formal spaces (see Fig. 9.1, Augmented Learning Space). In this way, social media establish a user-centred and co-constructed hybrid learning space; one that reaches beyond higher education's boundaries to incorporate lifewide learning contexts and leading to the creation of a lifelong learning space.

Four case studies inform this chapter. One describes a student's experience of *Facebook Groups* and one explores the role of artefacts in networked learning. Two describe the role of tweetchats as learning spaces. The chapter begins by introducing the tweetchat as a learning space.

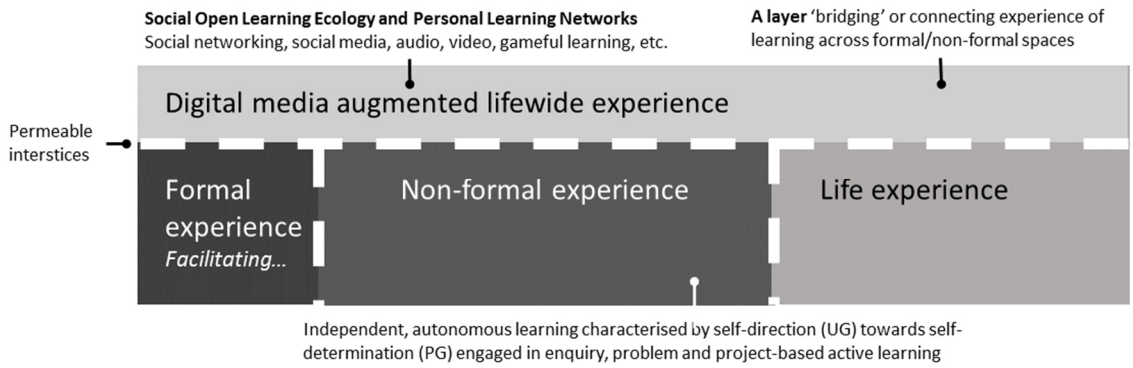


Figure 9.1. Augmented Learning Space

9.1 About tweetchats

Tweetchats use *Twitter* as a discussion space to bring people together around a topic of common interest. They are notable for their prolific generative thinking, require basic *Twitter* knowhow and are characterised by their pace and simple design. Tweetchats are unlike other online learning spaces because of their highly interactive networked nature and their capacity to value the diverse levels of curiosity, knowledge and experience of participants.

Normally, an invited chat leader will publish a blog post or video in the days preceding the chat to bring a community up to speed quickly with key ideas and establish leading thinking. This enables participants to situate themselves in the topic, grasp the key ideas, and relate them to their own experience. A well-

designed tweetchat will have a strong focus usually structured around five or six good questions, accommodate diverse perspectives, and generate a rich set of resources for further reference and the ongoing development of the topic.

Twitter's constraints, especially the 280-character count on tweet messages, ensure that the tweetchat model is versatile. As with other learning spaces, clear functionality removes complexity, allowing interpersonal exchange to come to the fore. The intersection of multiple personal networks working together raises the quality of the discussion. A single well-crafted question can generate a great range of responses and hooks that allow any learner to find their purchase in the conversation, removing the tendency in other situations for a few voices to dominate proceedings. The potential of participants to connect with other people beyond their own temporal and spatial setting situates the activity as being an inclusive form of scholarship, not just a transactional matter.

Favouriting, retweeting, double-hashtagging and being 'mentioned into' a discussion highlight the permeability of the tweetchat 'classroom', with connections and learning being made beyond the designated boundaries of space and time into each participant's personal network and professional practices.

The participant-centred approach demonstrates how individuals navigate topics differently, exploring depths where needed, skimming through other dimensions, or backtracking where peripheral vision highlights important new dimensions being raised in 'earlier' parts of the discussion. Occasionally someone will reply directly to someone else without using the hashtag, effectively wandering out of 'the room' for an aside. Tweetchats disrupt the binary of synchronous–asynchronous communication and instead present a 'multichronous' multidimensional flow of live conversation. While the tweetchat epitomises an intense multi-participant and immersive conversation, it also lives on as a learner-generated resource. Conversations can be sustained through blogposts, Storify records, informal collaborations and projects.

A tweetchat may feel fast and ephemeral, but it can support deep and slow learning, and create a sustained learning context. The simplicity of the model and its co-operative nature mean that it can be easily adopted and adapted by

academics and students alike. The key lesson, as exemplified in the following two case studies and evident in other accounts of networked learning, is that a simple space with limited functionality and communal investment affords so many possibilities.

Case study: LTHEchat: the use of tweetchats

Subject: Sue Beckingham

The #LTHEchat tweetchat is a large co-operative learning community of academics and educational developers that meets weekly through *Twitter* to share and develop knowledge. It was initiated by Sue Beckingham and Chrissi Nerantzi with peers from other UK universities. There is a high level of regular engagement in #LTHEchat, even though it runs on Wednesday evenings from 8 pm to 9 pm. It proves the viability of *Twitter* and other social media as a learning space. Sue says, 'I can guarantee I will go away having learnt something useful or met another person that I want to connect with … but it's also a social learning experience.'

#LTHEchat grew out of #BYOD4L, an online self-directed course built upon social media and run over five consecutive days. #BYOD4L's evening tweetchat revealed an appetite amongst the higher education developer community for discussing academic innovation.

Each chat has a specific focus announced by the co-ordinating group on the LTHEchat.com website. People from within the community have volunteered to lead topics; more recently tweetchat leaders have come by recommendation. Topic themes are diverse and reflect the wide experience and interests of the group. In the week prior to my conversation with Sue the community had discussed 'The use of art in cross-discipline undergraduate education'. Previously topics included 'Employability', 'Flipping the classroom' and 'Global dimensions in learning and teaching in HE', for example.

Announcements and reminders are tweeted and retweeted in the half hour before the session. Three quick tweets set things off. For example:

Are you ready? Let's make a start... #LTHEchat

Don't forget to start your answer with A1, A2 etc and use the #LTHEchat

Q1: What is your definition of 'the arts'? #LTHEchat

The conversation flows quickly. Everybody seems to talk at once. There were over 200 people in the previous week's discussion, posting more than 700 tweets in the hour, and Sue believes many others just observe the discussion. The breadth of experience, knowledge and personalities surfaces as the conversation escalates. For example, a regular participant kicked off at 8:01 pm:

A1 Anything creative that produces an arte-fact ;)! #LTHEChat

The use of 'A1' ties the answer to the question (Q1). This tweet exemplifies the complex mix of insight and playful dexterity common in tweetchats. It shows the respondent as someone who is keen to see the conversation started and who wants to encourage a friendly tone. The use of the emoticon clarifies that this is not meant to be profound.

Crafting an answer that is both insightful and succinct within the remaining characters challenges participants to think deeply and carefully. Within the next few minutes more considered responses are posted. Even quickfire respondents are likely to follow through with an answer that clarifies or develops their initial response or that builds on what others have posted.

Sue reflects:

People initially find it quite overwhelming … it's a new communication space for a lot of people, but then they quickly pick it up … People start to connect with each other. It develops into a community because they start to have these interactions ... People will answer [the questions], but then there are the conversations that happen in between.

The chat will move on to question 2 after about ten minutes. There is no expectation for everybody to keep up. People choose their own pace. Some keep up with the latest tweets, while others want to work through all the responses. Some initiate spur conversations and linger there for a while. It is not unusual for people to be immersed in discussions around question 1 while others are forging ahead with question 3 or 4. Sue explains that the social media space requires us to rethink what is meant by expertise:

There are 'experts', but also people who just look things up as they are participating in it. It makes them remember something that they've seen, heard or read ... they've made that association. They feel as though they've got something they can contribute.

Participants use the discussion to mine or develop their Evernote notebooks or other social bookmarks, 'favouriting' the contributions they like or want to return to later. They will also retweet contributions they want to amplify or share with people in their own networks. Sue points out, 'You can get mentioned "into" a chat because someone knows you have the answer or can contribute to it.' Some chats tie in more than one network through double-hashtagging topics where there is common interest; metaphorically, this opens the room dividers between classes. Doing so provides opportunities to make associations and extend networks.

#LTHEchat is an egalitarian space with professors and teaching fellows sitting alongside less experienced people, all of them constrained by 280 characters per contribution. This is not a formal, provided space, but a multidimensional space owned by each participant. Sue says it contrasts with the classroom in which novice voices struggle to find legitimacy: 'There's more thinking time. … Even though it is a really fast collection of conversations within the hour, it doesn't matter that they're not in real time.'

#LTHEchat is as much a social occasion as an educational opportunity. Many of the people who turn out each week are 'regulars' in this Third Place (Oldenburg, 1989). Others will turn up just because of the topic, though some of these will stay on to become regulars.

Case study: Students building their own space: the RONC revision group

Subject: Sarah 'Smiz' Smith

The Radiotherapy & Oncology Revision Group (RONCrg) was set up by two students, Sarah and Emma, for the benefit of their peers on the BA in Radiotherapy & Oncology. They organised the revision group towards the end of their first semester as a two-hour tweetchat using *Tumblr*, *Twitter* and *Storify*. The chat ran on Tuesday evenings using the hashtag #RONCrg.

The students created an effective study space using social media which allowed them to reach out to and involve professional networks. However, this study highlights how such student-led initiatives are dependent on high degrees of student confidence, imagination and digital fluency.

Sarah is a keen collaborator who understands the value of establishing a co- operative peer learning community due to her previous experiences of studio-based learning at undergraduate and postgraduate levels. Now, she has returned to study at undergraduate level in a different disciplinary culture. She says: 'It's quite competitive … I wanted to use collaboration to learn because that's how I bounce ideas and get best practice.' She highlights the intellectual and social advantages of learning collaboratively and wanted to develop this with her new peers.

Sarah says social media is the natural digital space of a creative and intrinsically motivated collaborator. She uses *Twitter* habitually and values *Google Drive* for its accessibility. She understands the benefits of being open and of sharing work as a context for learning and is not protective of her academic work. For her, sharing your work is a learning strategy designed to multiply the impact for everyone.

Twitter, the key tool in their revision group, is 'collaborative and anybody can access it. … And that means all different healthcare professionals.' Sarah says *Tumblr* is important too, being easy to use.

Facebook is used by students on her course, but it was not the right tool for the RONCrg. In Sarah's experience, students use *Facebook* superficially for checking deadlines, information and sources, or occasionally for comparing different approaches to professional practice. She says *Facebook*'s approach to owning the content produced by its users has created a sense of distrust amongst some of her peers.

Twitter, on the other hand, 'is open and there's nothing much private about it. It seems more of a connection tool rather than a personal family and friends [tool like] *Facebook*.' Sarah likes Twitter's 280-character constraint: 'It keeps it concise, whereas in *Facebook* you can just copy and paste anything off the Internet as your answer.' Conciseness, she says, 'helps revision-wise as well. In the end you've got these nice concise

points. Whereas if it's a big paragraph, you know, you can go off on a little bit of a tangent.'

Healthcare professionals and tutors joined in with the RONCrg tweetchat. 'We got qualified Radiographers interacting with us. It was awesome when it happened, but I wasn't expecting it. That would never have happened on a *Facebook* Group.' RONCrg also connected with the Society of Radiographers and asked them to like and retweet their tweets. This connectivity has developed Sarah's awareness of the different standards used in radiographic practice, even within adjacent cities in the region:

> *There are variations in care … So, I thought if we can get people together from all different places sharing what their standard practice is, firstly, it would be really good for us as students to realise the variation, but also it would just give us a resource to know exactly what's going on.*

Sarah and Emma established the revision group by publishing a few ground rules in a *Tumblr* post, referencing guidance they had received during their course induction and university guidance for good practice in using social media for learning.

The group's *Tumblr* site underpinned the tweetchat by providing a series of scenarios created by Sarah, describing patient symptoms using titles like 'Brenda and her breast lump' or 'Joan and her skin lesion'. The scenarios were designed to support topic discussion, reasoning and decision making. Sarah says that producing the tweetchats was time-consuming, although an invaluable revision opportunity in itself.

The evening tweetchats were based on a review of patients' histories. Questions and answers are prepared in advance and brain scan images are incorporated into some questions. Originally set out in about 150 words, each case is broken down into six tweets.

One of their tutors became aware of the tweetchats and volunteered to look over the scenarios, questions and answers to check their accuracy.

In addition to the *Tumblr* postings and the tweetchat activity, an archive of the discussions was created on Storify forming a thematic learner-generated revision aid.

Engagement with the tweetchat grew steadily, on the course and beyond. Sarah says, 'It grew a little bit each month. Then,

by one of the last ones, we had people in Canada and radiographers from centres we're not affiliated with. So, it was really good.'

While Sarah had hoped that her peers would take over leadership, this did not happen. However, she says that leading #RONCrg 'was a great learning experience … my *Twitter* network now is much bigger and much more professional than it was in my first year'.

Case study: Facebook Groups as self-regulated Third Space learning sets

Subject: Charlotte Burton*

*this student's name has been changed to protect their identity

Charlotte Burton, a Marketing Communications and Advertising student at Sheffield Hallam University, believes her regular participation in peer-led *Facebook Groups* supports and motivates her during module assignments. She says *Facebook* is accessed habitually by her peers as a supportive learning space, day in and day out, but unlike the course VLE, this activity is not visible to their tutors.

Charlotte says she is 'an active social media user in both my social and university life. There is no conflict between the two. I can keep both separated quite easily.' Charlotte is acutely aware that the social media space is critical within her own discipline and observes that employers expect new graduates to develop this dimension of their business for them.

She explains that establishing a *Facebook Group* is an automatic first step in a group assignment. 'We will make a group and share notes or work we are doing, keep up with who's doing what, uploading versions of everything when we're doing the assignments. To keep a check on everyone as well.' She says that 'depending on contributions from each team member, it's usually equally led with team members adding their contributions to the group to keep everyone updated'.

I ask how well she knows the people in her *Facebook Groups*. She says 'we are all in seminar groups together so I know them well as friends'. What happens when someone in a learning set does not want to use *Facebook*? She replies, 'I have never come across this before, but I believe email would be used instead'.

'I have never come across this before, but I believe email would be used instead'. I ask Charlotte whether her *Facebook Groups* spend time establishing ground rules. She replied:

> *Now we're in final year it is much more important for everyone to get involved in the groups. In previous years, people would probably get away with not being involved. However, now if someone is less involved they would be marked down in peer assessment. The only ground rule is to respond to messaging in the group and do the work on time.*

Charlotte has noticed a shift in attitude in her final year, but she says *Facebook* has 'faded' only because the work is more individualised:

We do support each other in learning. This is evident through messaging each other for help on *Facebook Messenger*, *WhatsApp* or txt. However, [this is] never really in a group environment. I would probably only message particular people I am close with that I can rely on to give good advice.

Facebook use is pervasive. Charlotte says there is no doubt that her peers will have a *Facebook* account. We compare it to Google+ as a study space. 'I think Google+ is a good way of communicating in a learning environment, however you must have a Google account to access it. It's probably not as accessible as *Facebook*. If everyone was educated in the platform it would probably take off, but as it's not as popular I doubt it would be used voluntarily when *Facebook* does the job.'

Case study: Photobook Club

Subject: Matt Johnston

Matt Johnston, a Lecturer in Photography in the School of Media and Performing Arts at Coventry University, established the Photobook Club in 2011 to promote learning through discussion around the physical form of the photobook. He began by exploring the most influential photobooks of the twentieth century before extending the discussion beyond the classroom using social media as an open space. In devising this approach, Matt has sought to challenge the inherent 'authorship' of his academic role to develop a networked authorship using books as well as hashtags to mediate learning spaces.

Photobooks are large-format books of photographs. High-quality photobooks can become iconic for students studying photography, as they are associated with well-known photographers, ‘classic’ images and ‘landmark’ exhibitions. Matt says the book as commodity, like the exhibition or the celebrated photograph, obscures the artistic meaning and merit of its subject. The challenge for the art educator is to strip back these meanings to reveal the original intent, qualities and contexts inherent in the image.

The photobook is an accessible way of establishing a manageable and immersive learning experience and provides the teacher with an ideal space for teaching students about curation and historical context.

Matt decided to introduce his Photography students to photobooks by running a review-based activity to develop greater appreciation of bodies of work. This broader critical understanding was needed to demystify the review of photography and to encourage his students to make their own judgements.

Matt devised ‘curated learning journeys’ so that anyone could take part. To achieve this, he established the Photobook Club as an open space for inclusive conversations around the photobook (Johnston, 2014).

Matt created an activity space incorporating the use of the hashtag #fromthelibrary so students could situate their conclusions about their selected books within a wider discourse. Students engaged with the activity and developed their appreciation of photography as an art form.

The concept of ‘club’ became location-agnostic, working equally for physical or social media, enhancing the inclusive philosophy of the Photobook Club model and Matt’s developing conception of a networked authorship. This emerged from reflecting on his involvement with #PHONAR (Losh, 2014) and #PICBOD. #PICBOD is a course that primarily exists around a Google learning community in which students tackle weekly photographic course assignments. Lecture notes, student work and video summaries are collated by the students, who assume some of the responsibility for curating their learning in this space.

Encouraged by the success of #fromthelibrary, Matt decided to run the same activity as a public event, thereby developing the idea of the Photobook Club. People sat and talked with him about the photobooks and, following this success, the distributed phenomenon of the Photobook Club rapidly developed a global

presence. His model of learning through the photobook grew by encouraging followers on social media to use and develop it.

The Photobook Club has become an informal semi-structured learning space. Book clubs globally have become established on social media, usually as *Facebook Groups*. The book, the club, dispersed leadership, co-production, and social media in a global context together form a hybrid learning space.

Networked authorship proposes a more distributed academic role and Matt recognises how his academic leadership introduces a bias that conflicts with his desire to deepen engagement in study of the subject. He says, 'I have been trying to remove as much of my own authorship as I can. This has allowed these other organisers to have their own style.'

There is local authorship and self-governance in his conception of the global Photobook Club community which brings benefits to Matt's own students. Their learning is now situated within a global context of potential collaborators. What was once experienced as parochial and esoteric by students now has new meanings and legitimacy. The photobook has moved away from the exclusive, reverential and iconic status it had to become a locus of critique.

Networked authorship and objects as mediated learning space are also the basis for the Photobook Club's 'Box of Books' project. This project sees seven new and critically acclaimed photobooks boxed and shipped to the different Photobook Clubs around the world. The local groups 'author' their own events using the Box of Books as a key resource. A small notebook and pen are included in the box for people to add their comments on the books and to pose questions for subsequent recipients of the box to discuss. In this way, the box and the notebook become a mediating space, acting as a 'physical hashtag' connecting the network in a rich conversation.

9.2 Networked authorship of socially mediated Third Space and Place

Matt Johnston's case study focuses on networked authorship as a disruption of the academic role. This is evident in the leadership and co-production described in other case studies here too.

In the case studies, we see how the *Facebook Group*, the *Twitter* hashtag and the idea of 'club' create new self-regulated, co-owned, non-formal learning spaces. They are Third Spaces, being neither 'university' nor 'home'. They are also negotiated co-produced loci of networked authorship. More than this, they are Third Places, having regulars, being accessible, and creating a sense of ease (Oldenburg, 1989). In the tweetchat model, participants enjoy and value being at ease in their self-generated space. In the #LTHEchat, for example, there is a strong sense of trust and fun in which active participants display confidence in the way they ask questions of each other; not just answer them.

Social media extend the ownership of the learning space, though the relationship of social media space with institutionally provided monolithic spaces is uncertain. It is not clear, for example, how they reflect on each other in terms of establishing unrealistic expectations in either direction. Social media enable outcomes that are not as easy to achieve elsewhere. The tweetchat model, for example, cuts through the protocols and formality of other academic spaces and assumes participants will be able to self-regulate their learning. While this is potentially liberating, such assumptions raise serious questions about inclusivity and the readiness of students to take responsibility for their learning.

At the same time, the potential for equity within social media group spaces is a great strength, whether the situation is predominantly formal, as in Beryl Jones' Snapchat case study (no. 22), or non-formal. Removal of protocols and formality comes at a cost and, while Third Spaces can be understood as clubs, great consideration is needed to safeguard against them becoming elitist enclaves to the detriment of some learners.

All in all, such spaces are valuable as social places in which common learning and epistemological challenges can be addressed. This is evident in David Eddy's CPD MOOC too (see case study no. 8), in which EPCC bridged the academic, professional and global real-world contexts of its participants.

There, *Twitter* allowed the participants to establish relationships that extended beyond the normal course construct to scaffold the sharing, collaboration and development of professional learning networks through association with the course space.

While social media may have the advantage of being familiar and commonplace to their users, they are nevertheless likely to be novel as learning spaces to many. Novelty is not only about having social media accounts and understanding how a tool works; it is also about using the space in a way that is unfamiliar for one's personal education. Sarah Smith, for example, was clear how social media space could be constructed to support co- operative revision (see case study no. 15). The detailed configuration of the RONCrg space followed that understanding and conviction. Her confident leadership of her peers may have been exceptional given her previous experiences of higher education in a studio-based discipline. If such student-led spaces are valuable, what can we do as educators to encourage and support selfdirected independent and social learning in social media spaces?

9.3 Co-regulation

Successful learning spaces promote communal respect, inclusivity and selfregulation. The co-ownership of a social media learning space is dependent on explicit and tacit co-regulation.

Explicit co-regulation

In Charlotte Burton's experience of *Facebook Groups* (case study no. 16) 'the only ground rule is to respond to messaging'. In Sarah Smith's RONCrg, on the other hand (case study no. 15), the students readily adopted the ground rules of their profession as the basis of their interactions. Sarah had brought her experience of other courses and cultures to the less experienced Oncology study group. Her conception of an effective study model was derived from her experience of an inherently co-operative and selfdirected studio-based learning culture, and this was different from the more dependent hierarchical learning culture of her Health course. Nevertheless, she appreciated the paradox and the need to negotiate a networked authorship with her new peers, her tutors and professionals rather than assume their automatic participation. The social

learning space is regulated by the principle of give- and-take; indeed, to achieve the quality of learning experience Sarah knew to be possible, she had to be selfless and leaderly.

These philanthropic qualities are evident in Matt Johnston's approach too in his commitment to networked authorship (case study no. 17), and in Anne-marie Steele and Stella Jones-Devitt's philosophy of co-production and the eventual enactment of this by their students (see case study no. 1). Each had to define and be explicit about the workings and expectations of the learning space, and be ready to challenge expectations and definitions of academic leadership.

Tacit co-regulation

Tacit co-regulation is evident in the co-operative nature of online socially mediated space in which an unspoken etiquette is evident. In social media learning groups, there appear to be unwritten laws that ensure the maintenance of mutual care for the rights of co-learners. This is evident in Charlotte Burton's comment about a single ground rule, with the implication being that the group expects give and take. Beyond that, it accepts the right of everyone to be part of the group, and to contribute or withdraw.

Charlotte's view is that by joining peer-led groups you are making a tacit commitment to, and accepting some responsibility for, the success of your group. Beryl Jones (case study no. 22) has built a communication channel specifically designed to accommodate her students' diffidence.

Sue Beckingham (case study no. 14) supports the right of participants to 'lurk' or observe. While lurking may be a valid first stage to online engagement (Salmon, 2013), Kim *et al.* (2015, p. 338) note that:

> *even highly engaged communities have little educational worth if they do not involve relevant transactions between nodes. In other words potential students must be motivated to participate, but they also must participate to increase self-efficacy and motivation.*

Nevertheless, Sue knows that, unlike a physical space, the social media space can accommodate invisible presence and this is valuable.

Charlotte observes that student engagement in social spaces changes to reflect the natural patterns of their context. As her course emphasises the individual rather than the group, her peers have turned to more individualist social media tools and behaviours such as WhatsApp and direct messaging.

A leadership of the collective

There is evidence of a leadership of the collective in these social media learning spaces. The individual in the network seems hypersensitive of the need to do their bit. The crowd defends the rights of the individual and vice versa. Or, quite possibly, it may be that the quiet non-participant is not as visible as they would be in a physical setting. A social media space may just create the illusion that the whole class is active.

9.4 Friendship and alienation

Friendship mediates the social learning space, as is seen this chapter's studies and others in the book. Friendship may be understood as a 'third relationship' perhaps, as in Third Place. In the context of social learning spaces, peer co-operation is fundamental to a successful experience. Charlotte Burton in case study no. 16 describes having 'automatic' learning relationships which are crucial to peer motivation.

A sense of bonhomie exists amongst the active participants of the tweetchats epitomised by the creation of 'micrologues': small engaging conversational eddies in the larger flow of conversation through favouriting, replying and retweeting, 'connecting out' and 'connecting in'.

New types of trustful Third Place relationships are developed in social media spaces that disrupt, enhance and transform learning etiquette. Sue Beckingham's description of the #LTHEchat confirms this. The place is accessible and its identity is largely defined by its core group of enthusiastic regulars. The avatars depicting the participants project them at their best and this plays its part in creating a convivial atmosphere. There is no space for pontification or domination because the conversation is structurally diffused, whereas its wit and playfulness spread through the network. Twitter's text character limit helps to maintain an unpretentious tone. Together, this creates a levelling place in terms of rank and status. This all adds to the essential

homeliness of the tweetchat, evidenced in the regular return visits of participants.

Access and homeliness are present in the case studies, each referring to the disruption of the university–home demarcation. The benefits of an interactive and online student revision group over face-to-face meetings, for example, include being able to work together from home, facilitating meeting scheduling and avoiding the need for physical space on campus. For the #LTHEchat, the conversation's informal status is evident in participant references to having the occasional glass of wine, comments about bringing pets to the chat, or multi-tasking around watching Bake Off or some other cooking show. Stories from the tweetchat indicate how they are experienced as a dual presence of multi-tasking, sometimes conjoining informal and formal concurrently and experienced as polycontextual bridging (Elstad, 2016). This may help us to define good learning space more generally.

Alienation and exclusion

The drive and energy of active and enthusiastic participants inevitably obscures other stories in social media spaces. It is not clear who is observing and why; who is not present; and who feels excluded or distracted. As in any space, attendance, engagement and learning should not be confused.

To what extent is this compensated for by Charlotte and Sarah's assertions that their peer communities bring extra support, or by Sue's commitment to the right to observe? If such social media spaces in time become critical to developing student belonging, who is there to pick up those who feel excluded or who go unnoticed? Who assumes responsibility for managing the ongoing motivation of the group?

9.5 Purposeful collaborative learning amongst peers

Each of the case studies highlights the value of conversation amongst mixed participant groups in the connected classroom. The diversity of participants leads to insightfulness, and this is valued as much as the sharing of knowledge.

Unlike a Third Place, the learning in a tweetchat or *Facebook Group* tends to have purpose; participants are not simply gathering or resting. Sarah says social media is the natural digital space of a creative and driven collaborator; a

space which enjoys the benefits of being open and of sharing work. Her view is that sharing your work is a learning strategy designed to multiply the impact for everyone. It is achieved by being productive together, thereby establishing a learner-generated context (Luckin *et al.*, 2011).

The social media learning space is situated in the open, although this can be controlled in some spaces by creating closed groups and more private channels, for example in *Google+* and *Facebook* communities. Connectivity has the potential to establish authentic learning networks. Here the learner can redefine themselves in the company of peers through their encounters with MKOs. Indeed, networked peers have a potency, identity and standing that is more than simply 'classmate'; they have agency through their interconnectivity with peers, more experienced students, alumni, professionally qualified practitioners, and tutors. By networking with professionals, or even within reach of professionals, RONCrg participants stretch themselves, adapting their identities to the situation as they associate with and align to the professionals they aspire to be. Professional literacy, social and cultural capital are outcomes of the authentic learning network therefore. Sarah notes: 'We've had some service users get involved [who have shared] their perspectives on certain themes each month.'

9.6 Adaptability and versatility through familiarity and simplicity

A Tweetchat may feel fast, transient and even ephemeral, but tweetchats also support slow learning strategies in which ideas generated frenetically through activity can be used for review and revision. They establish a new kind of flexible, adaptable and versatile multidimensional learning space that works both synchronously and asynchronously for each learner. Tweetchats mix the vibrancy of the moment with the opportunity to review the co-produced artefact generated through conversation in the *Twitter* feed itself or curated later through a Storify record of the tweetchat. In other case studies, Toby Carter (case study no. 10) and Jill LeBihan's (case study no. 13) students signal creativity and narrative literacies that are often lacking in 'scoop-it-up' approaches to curating tweetchats and other digital activities. These two examples indicate the benefits of looking more closely at the affordances of social media space in order to create new types of learning situation.

The permeable classroom: pervasive, open boundaries and augmented space

Tweetchats and other uses of *Twitter* and social media establish the concept of the permeable classroom; a space defined by its connectivity rather than its solid borders (see Fig. 9.1, Augmented Learning Space).

Charlotte Burton, as with the mature students in the Steele and Jones- Devitt study (no. 1), describes how her *Facebook Groups* satisfy the mutual need for peer association. More than this, the need is met effectively 'because students are already there.' In effect, it is not that *Facebook* is an innovative space, it is the commonality of the students' lifewide habits and the ways these can be accommodated that are valued by them.

The example of double-hashtagging a tweetchat conversation describes a classroom that is open and connected. It reverses the inadequacies of disconnected or enclosed learning spaces. Connected spaces situate learning enquiry and action across, between and beyond formal learning spaces to the mutual interest and benefit of communities (see the Natalie Wilmot and Diane Rushton case study, no. 19). Connected spaces and global contexts can enhance the meaning, knowledge and the way it is experienced and reviewed. The RONCrg and EPCC MOOC case studies came to life because of the multiplicity of connections across their respective academic-professional networks and the further serendipitous connections that were made.

The power of the hashtag to reach beyond what is known has a remarkably similar role to Matt Johnston's box of books. Hashtags and boxes mediate engagement, each accommodating a globally distributed network with a tendency to seed learning virally. The objects or the tweetchat questions, like slides in a presentation or stages in an experiment, are simply structural devices designed to stimulate each student's learning.

Looking beyond the idea of accommodation, the studies show evidence of pervasive augmented learning space. Augmented connectivity comes from the constancy of the media channels and the access that personal devices bring, creating a permeable layer that sits across all corporeal activity. This is most obvious in Kieran McDonald and Ian Glover's Beacon project case study (no.

23), but it is evident and most significant in these social media examples. The ecological and permeable nature of learning and space come into alignment: smart personal technologies and social media ensure there is a continuous learning space that accommodates the constancy of learning. Constancy changes the learning discourse.

The usability of 'less is more'

The limited functionality of social media tools is one of the strengths of social media. This contrasts with the multifunctional design of monolithic provided learning environments. Twitter, Snapchat and WhatsApp, like a SCALE-UP classroom, have limited, fixed functionality. This skeletal design in which few things are fixed exponentially grows its possible use. Sarah Smith, in her preference for *Tumblr*, exemplifies this when she says it is *Tumblr*'s simplicity that aids accessibility and productivity. The power of the tweet is notoriously its concision. Social media works when its users understand its essential structure and Sarah says this is often not the case with *Facebook*, so we need to be clear of the need to differentiate social media. Charlotte Burton could see that *Google+* would not meet the needs of her peers, despite its strengths in other contexts, because it was unfamiliar and appeared too complex. As we will see in the case of Beryl Jones's use of Snapchat (case study no. 22), it was the lack of functionality that helped her to address the challenge she faced in her classroom. For David Eddy (case study no. 8), Answer Garden is successful because it crowdsources learning by asking each participant to submit only a single word. In each of these examples, the distributed and nodal nature of learning combines to create a rich picture simply.

Learning through multilogues and backchannels

What distinguishes a modern classroom from the industrial-age classroom is the sound of students working. In a blended, hybrid learning space that background ambience can be harvested for the benefit of all by using a backchannel. Ross *et al.* (2011) describe the digital backchannel as a 'multidirectional complex space in which the users make notes, share resources, hold discussions and ask questions as well as establishing a clear individual online presence'. They say backchannelling implies the simultaneity of formal and informal lines of communication and their analysis revealed the

close-knit nature of their research community and potential to intimidate new members. Bilandzic and Foth (2017, p. 21) explain that digital backchannels 'make invisible social aspects of space visible, thus enabling users to better identify likeminded others'. A *Facebook* chat is a 'discussion channel of ideas, which takes place without disturbing the lecturer', provides just-in-time responses, while removing the need for a student to worry about asking a what might be a 'stupid question' in front of everyone (Stirling, 2014). Wiltwhatman (2013) describes how *Twitter* is used as a collaborative live lecture note making tool and how this is like 'being plugged into every student's brain at once'. Middleton and Kay (2016) have demonstrated the value of collaborative note making using social media. Orton-Johnson (2014) observes that some academics worry that the backchannel introduces cacophony into the lecture theatre while others (Maloney, 2007; Selwyn, 2007, 2009) recognise its potential as a supportive and informative space for active pedagogy. In her research, Orton-Johnson (2014) describes *Facebook* as a backchannel space that crosses boundaries and time, reflecting the notion of the augmented layer. It creates a quasi-academic continuity that is valued by students, blurring boundaries of the academic and social, and converging their academic and everyday identities.

The active digital classroom is characterised by what Megele calls multilogues (2014b, p. 47). These are:

> *many-to-many communication, where each message is addressed to more than one potential receiver and may be answered by more than one potential replier. Furthermore, each reply in itself is implicitly addressed to more than one potential receiver and may receive replies from more than one source.*

While Megele discusses multilogues in the context of tweetchats, Shank (1993) originated the term in relation to online discussions. By blending such social technologies into physical spaces, the possibilities of the multilogue backchannel emerge. Whether physically or virtually located, many-to-many or few-to-few conversations fundamentally extend what can be achieved in any existing space to create a blended active classroom.

The multilogue can be found in the notion of the backchannel where it can be more broadly applied to include other media and tools.

Webinar backchannels

Webinar technologies such as Adobe Connect and Blackboard Collaborate incorporate a range of functionality forming versatile online collaborative spaces. The chat tools sit alongside other media including the presenter's slides, annotation tools, presenter and delegate audio channels, voting tools and virtual whiteboards. They allow learning communities to work together (see Natalie Wilmot and Diane Rushton's case study, no. 19). They can also bring others into the classroom; so, for example, connections can be made between students and clients, service users, professional groups and other dispersed people. Where students have access to mobile technologies, the same connectivity can be exploited within a given space, like a lecture theatre, to establish a backchannel.

Box 22. Using backchannels

The following examples illustrate the versatility of the backchannel.

- **Co-location feedback** - a co-located class uses the backchannel to respond to points raised by their lecturer, or other presenter, during the class. Peers also respond to each other's comments;
- **Connecting contexts** – dispersed classes located locally or globally share contextual information in response to topics raised by their lecturer;
- **Invited speakers** - invited speakers and expert groups can be connected into the classroom to share knowledge and experience;
- **Double headers** – courses can be co-led by academics working across continents supporting interaction across their respective cohorts interact (see Natalie Wilmot & Diane Rushton case study);
- **Vertical interaction** - peers across levels may 'look in' on lectures to interact, especially where a culture of peer mentoring exists;
- **Horizontal interaction** – peers can engage in common modules and activities to support inter-professional learning;
- **Backchannel homes** - social media hashtags create spaces that support synchronous or asynchronous association amongst self-directed and self-determined individuals and communities. Tweetchats are a good example of this.

The lecturer needs to decide the extent to which the backchannel develops a life of its own in an active classroom. Learning in the backchannel can take many forms. For example, students,

- seek clarification from their peers, from the speaker or the speaker's nominated 'agent' (someone who can marshal and summarise conversations and feed these back to the presenter at key points);
- respond to or develop a point according to their own knowledge or experience;
- breakout into chat rooms;
- vote and discuss the outcomes;
- access links shared by the lecturer;
- co-produce notes, share resources, comment, amplify ideas (Bruff, 2010).

9.7 Social media learning space

Socially mediated Personal Learning Networks

Blaschke (2014, n.p.) discusses the paradox of provided monolithic monodirectional one-size-fits-all VLEs/LMSs in which students are 'exhorted to be creative, participate, and to take control of their learning'. Spatial isolation is anachronous and at odds with life beyond the classroom today.

Personal Learning Networks (PLN) emerge from, and are defined by, a shift towards more distributed expertise, collaborative and facilitated learning, networked learners, and openness (Stewart, 2013). Cronin (2014, p. 407) says 'the confluence of mobile connectivity and social networking has created new possibilities for social interaction that do not require physical presence'. Together they create the conditions for a hybrid selfdetermined social, open space for networked learning.

The essential idea of PLNs builds upon the concept of Personal Learning Environments (PLE) as a response to the proliferation of freely available social media tools and the personal construction of a self-assembled, multifunctional, online learning space (Attwell, 2007). Couros (2010, p. 125) notes that PLNs are 'the sum of all social capital and connections that result in the development and facilitation of a personal learning environment'. PLNs therefore emphasise learning with others, rather than learning with technology, in ways that involve individuals connecting and collaborating as nodes in a dynamic network.

Indeed, Cronin (2014) makes the point that, while the PLN is generally accepted as a phenomenon of online social media, it is not a precondition of a PLN. The design of learning spaces, whether physical, digital or blended,

should heed desirable learning behaviours and should not be constrained by the management of systems or by invalid assumptions about learning.

The concept of PLN is closely aligned with thinking about learning ecologies, networked learning, self-directed and self-determined learning, self- authorship, and autonomous interest-driven learning. These ideas observe the principles of the learning paradigm and the role of education to foster learning capability. Learning is situated across formal boundaries and therefore connects with opportunities for authentic learning (Lombardi, 2007; Herrington *et al.*, 2014; Herrington, 2012).

Box 23. Personal Learning Networks

PLNs propose that individual learners will,

- form interpersonal connections as the basis for learning;
- learn in the open 'studio' alongside MKOs, valuing feedback from peers, professionals and global citizens;
- support peers in open and mutually beneficial learning relationships through joint learning enterprises, which may be short-lived or sustained (Cronin, 2014);
- take responsibility for motivating themselves and others;
- benefit from rich authentic learning contexts defined by the learner's situation, in the context of real-world problems;
- determine their own goals, and how they are reviewed and negotiated;
- value generative methods to acquire, create, and validate new knowledge together (Žubrinic´ & Kalpic´, 2008; Hoffman, 2009);
- value collaborative problem solving and co-construction using social media tools and social networked spaces;
- draw upon a network of personal, material and functional resources to meet personal and academic interests (Dlab & Hoic´-Božic´, 2009);
- organise and maintain materials using online portals, file storage and sharing tools;
- exploit the technical affordances of social media including the diverse use of rich media, the capability to embed media and to link to dynamically updated resources and sites using protocols such as RSS feeds;
- study at a pace and in ways that suit the learner's context and preferences.

9.8 Learner independence and self-determination

PLNs augment existing formal or non-formal spaces in higher education and become sites of self-determined lifelong learning. To use PLNs as self-determined learners, students need to be challenged and developed as learners

and effective networkers confident to work and study creatively amongst others in the open. The RONCrg is such a network, but it is unusual given Sarah Smith's confidence and prior experience (case study no. 15). Skills, behaviours, habits and self-efficacy take time to develop and universities need to consider how PLNs work as part of a learning transition strategy. Development can be scaffolded through an undergraduate education in which the dominance of the formal course learning space tapers off as the significance of a non-formal and self-determined PLN space grows along with final year work being more situated in more authentic real-world spaces.

The tweetchat, the *Facebook Group*, and backchannel interactivity exemplify connected and augmented learning space. The following chapters develop ideas of disruption, and the challenges and opportunities for social, open, mobile, rich-media learning.

Questions for reflection and discussion

1. The ability to network and form productive working relationships is an essential graduate skill. What more can you do to foster effective connective learning relationships amongst your students on campus and through incorporating social media as a learning space?
2. A truly blended, hybrid learning space is dependent on all participants having access to technologies and media so they can use them freely at their own discretion and through your direction. What are the implications of this for you? How can pervasive technologies be used to transform the way your students learn, in and out of class? How can you identify and remove barriers so that you can support greater and effective use and appreciation of social media for learning?

Being mobile [C3]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Being mobile. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 142 - 151). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

Studies of mobile learning have tended to focus on access to personal and portable technologies. This chapter, through two case studies, considers the implications of mobile learning by considering the new levels of connectivity afforded by mobile devices which allow learning to be resituated beyond the university's traditional bounded spaces.

Mobile learning has several meanings including learning with portable devices, learning while moving, and learning in and from distant situations. The two case studies mostly address the latter.

The notion 'field' is used to encapsulate the space beyond the university in which learning is situated by melding both the locus and focus of study. Mobile connectivity makes the field more accessible and, potentially, more authentic. It provides increased opportunities for deeper immersion in learning activities and gives greater access to data generated through acts of learning *in situ*.

However, the same technology threatens the integrity of the field as a site of study: its technological affordances have meant that traditional ideas of distance are compressed while the context of the site is disrupted by the presence of the technology, the ease of capturing data, and through homogenisation; factors which can affect the value of the subject and its study. Technological accessibility inevitably conflates the formerly distinct spaces and phenomena being studied. Culturally, the connectivity disrupts the emic (internalised perspective) and the etic (observed perspective) of those situations.

Mobile learners are immersed in 'unusual', 'uncommon', and 'other' spaces in which they form and enact new identities through practising skills in the field or presenting their shared identity collectively in an external context. They become legitimate 'lifewise' authentic critical explorers, responding to real and uncertain conditions in flux.

Mobile technologies can enrich hybrid learning experiences by increasing access to phenomena, however they can also undermine the integrity of the experience.

[298]

Mobile learning has been hard to conceptualise (Traxler, 2007) and development has tended to focus more on the potential of emerging technology and less on the potential of access to new situations until recently. Early techno-centric definitions promised 'anytime, anyplace, anywhere' learning spaces (Traxler, 2007, 2009). The focus on technology has given way to thinking about the importance of mobility, the learner's situation and their access to people and resources, regardless of place and time (Kukulska- Hulme, 2010). Context is now central to thinking about mobile learning (Traxler, 2016).

Our interest in mobile learning is primarily about the nature of learning in an expanded space that affords spatially rich experiences. This chapter is less concerned with the novelty and pre-eminence of gadgets than with the idea of access to new learning spaces that previously were out of everyday reach.

We will consider what this means for the lifewide learning space and the learner-generated context, but first the chapter is steered by two case studies which, in their own ways, explain mobility in terms of 'dis-location': being situated in 'other' or uncommon spaces. The first considers the conflation of space through the experience of the digitally enhanced field trip. The second considers the interstitial role technology performs in removing distance to support intercultural exchange.

Fieldwork enriches learning that happens across formal and non-formal spaces in and out of the university. The field as a learning space can be understood broadly as the student being situated within the context of their enquiry. It is both the locus and focus of study and its methods have wider applicability to the study of authentic spaces that exist beyond the core disciplines in geography and earth sciences, environmental sciences, biosciences, archaeology and anthropology (Welsh *et al.*, 2015). Thinking about connected and hybrid learning disrupts familiar boundaries both in field and non-field based disciplines.

Case study: Teaching and learning in the field

Subject: Derek France

> In this case study Professor Derek France reflects on the Enhancing Fieldwork Learning project (EFL) and its exploration

of mobile technologies. It provides insight into an experiential pedagogy involving the application of knowledge and skills, enquiry-based techniques, and the acquisition and analysis of data (Whalley *et al.*, 2015).

Fieldwork, situated in remote but increasingly connected learning spaces, is a signature pedagogy of a Geography degree (Hovorka & Wolf, 2009; Gold, 1991). Connective technologies have conflated formerly distinct spaces and consequently have changed what happens on campus, in the field base, and in the field itself. The quality of data gathering, analysis and application in terms of speed, detail and the way it can be shared, have also changed.

Fieldwork requires specific skills. Traditionally these include written note-taking, numerical data collection, drawing, map making, analogue photography and annotation, and Derek and his EFL colleagues have investigated how mobile technologies are disrupting these fieldwork practices (France *et al.*, 2013; Whalley *et al.*, 2015). He explains that the relationship between the field and technology has been constantly changing and adapting over time in response to the advances in technology and the opportunities this brings.

The development of personal mobile technologies has changed the nature of field-based study. The integrated global positioning system (GPS) functionality in mobiles has obvious application to geography fieldwork, although the accuracy and sophistication of GPS in mobile devices is not always equivalent to the tools they are simulating. Derek believes that

> *Personal devices offer students more freedom and opportunities to gather, record and analyse primary data … [and they can do this] much earlier and even in the field.*

In field trip preparation, students use technology for field site visualisation, development of methods, and clarification of notebook usage. In the field, methods include note-taking, photography, audio recording, digital storytelling, vidcasting, reflective diaries, geotagging photographs, visualisation of landscape, and accessing literature and teaching materials. Tutor podcasting can also be used to support learning. On return, the mobile devices remain useful for data collation, analysis and sharing.

As well as recording and sharing data in situ, mobile devices allow students to take information into the field. File-sharing tools like *Dropbox* and *Google Drive* ensure that data is properly managed and synchronised when next in range of wifi. Data can be analysed in the field or later in the field centre, while micro-blogging sites like *Tumblr* allow students to post text, photographs, links, quotes, audio and video quickly and easily; creating collections from media that, previously, would have been gathered on diverse devices and left for later processing.

On a practical basis, digital maps on mobile devices protected in *Aquapac* cases remove the need for paper maps, which are prone to weather damage.

Emerging mobile technologies and practices bring their own challenges. Derek says,

> *The opportunities that mobile apps offer to collect and analyse field data are ever-expanding and it is a real task to keep updated. It is all about offering choice to students about which app they can use and a platform of their choice.*

Derek cautions that mobile apps can threaten the integrity of fieldwork by being 'a distraction, and even discriminatory, if students are using old personal devices'.

Work in the field also highlights realities to do with network connectivity, battery life, wet and bright weather and carrying out academic studies in situ (Welsh *et al.*, 2015). 'It always comes down to battery life, accessibility to cloud storage and mobile devices', Derek says. While students are open to using their personal devices for fieldwork, albeit with some prompting (Whalley *et al.*, 2015; Linsey & Hall, 2010), they need to be convinced of its legitimacy, know about good digital practice, and be confident users of digital media. He thinks it is still best for departments to provide the technologies they need to ensure reliability and inclusivity.

Derek says students do not tend to have the experience or knowledge to link their devices to learning: 'They are all open to suggestions and ideas, but these need to come from staff. Generally, the students lack the initial skill sets to use their own devices to enhance their own learning.' He admits it is a struggle to keep up-to-date and suggests that students and staff need to understand the benefits of both digital and traditional methods

and must be able to use the analogue methods when digital is not available. The challenge 'is knowing when to apply the correct digital or traditional methods in given fieldwork contexts. For this you need fieldwork experience or a skillset to adapt. Or like I do, I use digital as the default fieldwork recording method and fall back on traditional methods when digital methods fail.'

Learning *in situ*

Derek notes that having powerful personal computing in the field changes what can be learnt in situ:

We would spend a full day in the field collecting data in groups on scree slopes collecting hundreds even thousands of data points or measurements and spend weeks in session transcribing to a spreadsheet. Now we record this straight onto an iPad, upload via the cloud to the University VLE and it is merged and all ready for next week's session after the field class. Bingo.

Case study: The global learning space

Subjects: Natalie Wilmot and Diane Rushton

The design of an international collaboration for business students in the UK and Brazil has allowed Natalie Wilmot and Diane Rushton to explore how institutional and personal technologies and social media tools can be adapted for developing their students' cross-cultural communication skills. They reflect on practical suggestions for establishing an intercontinental collaborative learning space.

Natalie and Diane lead an undergraduate module on Cross-Cultural Management at Sheffield Business School. Cultural diversity is core, therefore, to their discipline and pedagogic philosophy.

Natalie says, 'The workplace is becoming increasingly diverse and international project teams are becoming the norm for many different job roles.' The module aims to prepare students for work in multicultural global organisations and markets by creating an informal situated learning experience using groupwork activities. Students need to work together to incorporate codified information representing existing Business models, while also developing valuable tacit knowledge. Natalie and Diane say that students 'know' a practice because they have experienced 'emic'; the insider's cultural perspective of a

situation full of nuances and complexities (Zhu & Bargiela-Chiappini, 2013). It was felt that learning as peers across international borders would help to challenge their misconceptions.

Overall, 65 students were involved, with 32% of UK-based students not being of British origin, creating a rich international mix in all the small groups. English was used as the common language and while UK students were co-located, Brazilian students were more dispersed.

The tutors created and remained members of a *Facebook* Group used for general discussions amongst the cohort. They thought that using *Facebook* would encourage students to wander out of their allocated groups to make broader connections across the cohort.

The student groups were required to agree the communication tools they would use for weekly themed discussions. While email remains a key business tool and students were expected to use it, Diane and Natalie believe it is limited as a learning environment so students were also encouraged to use *Facebook*, Skype, WhatsApp, Twitter, or other social media in any way they determined to be useful. In the first week, the students introduced themselves using video which the UK students created on their own smart devices.

The students generally valued and benefited from the international collaboration in terms of their module outcomes and employability. However, informal engagement in the collaboration was mixed. Students learnt that establishing productive international relationships takes time. Most were comfortable with using *Facebook* as a learning environment though they tended to choose other communication channels that they determined to be more suited for working in smaller groups (Wilmot *et al.*, 2016).

Diane and Natalie say plenty of time is needed for clarifying the purpose of the collaboration and for preparing students. Use of video conferencing, for example, helps to acculturate students and enable them to recognise their common challenges. Natalie says:

> *Some students are more concerned than we anticipated about privacy, and therefore didn't want to use social networks such as Facebook for this reason. We would*

therefore be reluctant to mandate particular media for communication and would recommend leaving this decision to the students themselves.

Assessing the confidence of students to use digital and social media was a challenge.

We did expect students to be much more familiar with the use of apps on smart devices than many of them actually were. We also need to make it clear to students why technologies are being used, to avoid it being seen as a 'fad', but instead something which can bring real value to their learning.

They also note the importance of designing a clear structure of weekly discussion topics to make it easier for students to move to a more participative pedagogy. Natalie explains:

There was some uncertainty, particularly at first, and this really highlighted the importance of scaffolding the project. Initially we envisaged that students would take greater ownership of the project themselves, but this ultimately did not prove to be the case, and tutor support was essential.

Student participation was 'very much a personal decision. We didn't notice any specific tendencies amongst particular cultural groups about whether to participate or not.' Some relished the opportunity, though it was obviously disappointing that others did not, especially given the aims of the module and the focus of their degrees. 'Moving out of the comfort zone is essential to provide the concrete experience on which students can then reflect', say Natalie and Diane.

Communication technologies and social media characterise the global learning space in their work. Natalie and Diane note that:

Synchronous communication would be preferable, particularly at the initial stage of developing the relationship, but it isn't always feasible due to class size and timetabling constraints, and also time differences when working internationally.

While their model aimed to promote autonomous learning, Diane and Natalie say, 'We realised that students do need significant tutor support and that a very clear framework for what will be achieved on a weekly basis is helpful.'

Box 10.1 Creating an international experiential learning space

The design of an experiential, online international space for collaborative learning can:

- establish a stimulating, challenging and concrete context upon which students can reflect;
- establish opportunities for engaging students in the self-directed creation of digital artefacts to promote collaborative intercultural learning;
- disrupt traditional understandings about formality and awaken appreciation of global networking;
- develop appreciation of social media as a viable space for intercultural and professional development.

10.1 Resituating learning: space as subject

Both case studies explored the use of technologies for resituating learning by enhancing the authenticity of the experience. The former builds upon the signature pedagogy of the field trip, the second seizes the opportunity of international connectivity.

The studies note the power of being situated within the field of enquiry: it is not only a space, it is the very focus of study. As we turn to connectivity and authentic situations, the mobile device comes of age. In field-based study the students are immersed in their study and connectivity enables them to share data with each other and send it back to the university. The field learning space has been invested in a layer of technology that now conjoins previously distinct spaces and experiences. Time spent processing data in situ transforms the quality of that data and the learning experience it underpins. The situation is captured.

This is also true in Diane and Natalie's study, where the students are the subject of their own study. The recorded videos, rather than live streams, involve a 'making attitude', giving the students more control as co-producers of the situation.

At the same time, conjoining time and space can blunt the distinctive nature of the learning experience and it can reduce or remove the slow learning gestation that characterises many pre-digital learning experiences. Derek France notes how this conflation can threaten the integrity of fieldwork as

signature practice. The field notebook is not simply a device that can be superseded by digital technology. It is an artefact full of meaning, having a multidimensional and tactile quality. It has embodied meaning that itself challenges and situates the learner in a tradition and with a sense of identity, due process and reverence. In the geographer's notebook, as with the artist's sketchbook or the scientist's lab book, the marks and methods and the rendered thinking and decision-making may be too easily lost to the digital. Innovation, therefore, is not only about adopting new methods; it must involve a conscious process of leaving former practices. In general, as Derek notes, academics and students tend not to look for ways to create new spaces with new technologies and media and they often lack the knowhow to integrate the digital into their practice. Yet the promise of the digital is the versatility it affords to transform learning and situate it in context (Herrington *et al.*, 2014).

Diane and Natalie approach academic innovation from the perspective of problem and possibility, being less directed by technological opportunity. Derek and his colleagues, on the other hand, have persevered with the technical opportunity, being pioneers early into the field. In both cases, innovators like Diane and Natalie and the EFL project team are tenacious, being committed to the future of their disciplinary contexts and practices.

The intercultural students were generally agreeable to the suggestion that they use *Facebook* and *YouTube*, although not all of them engaged. Proper engagement is dependent on being familiar with the technology and with everyone being clear about its relevance as a learning space. While academic innovators will follow hunches, students need to be convinced about the use of unconventional practices. This is true for innovation in any learning space. Novelty, in itself, is not usually persuasive.

Emic and Third Space dis-location

Derek France recognises how connected technologies can promote learning across formal and non-formal spaces, in and out of the university. Both studies identify the value of unusual 'other' spaces. This is partly about emic and Third Space 'dis-location'. Emic reflects the value of the insider perspective in a given situation as found in the sharing of knowledge and experience in the

international study. A Third Space was created that afforded a neutral space for exchange. Third Space also defines the qualities of the field trip, accentuated at the end of each day through common ownership over the social space. Derek acknowledges he had previously taken this for granted, yet now he appreciates how vital the end of day social rituals are to the success of fieldwork.

Third Spaces, like the field camp or the *Facebook Group*, bring richness and authenticity, and act as surrogate common spaces in situations where participants are dispersed and where they assume a temporary 'dislocated' status. The tension exists, however, in authority: who leads or gives permission, and who is paying attention and taking part? As noted in the Journalism case study (no. 4), the academic role becomes fluid in these new social spaces and switching authority on and off between formal and nonformal requires confident academic leadership skills.

10.2 Ubiquitous devices and pervasive media

The promise of mobile learning has been dependent on the ubiquitous ownership of devices by students. However, the lack of technical connectivity, usability, battery power, capacity, familiarity and interoperability, as well as cost, made the adoption of mobile learning unrealistic for most academics.

Connecting lifewide learning

The availability and utility of the personal device to enhance any learning context as deemed important by the learner is interesting. Pedagogically, mobility enhanced through the use of portable devices connects most obviously to experiential learning: the 'process of creating and transforming experience into knowledge, skills, attitudes, values, emotions, beliefs and senses. … a process through which individuals become themselves' (Jarvis *et al.*, 1999, p. 46).

The promise of mobile learning aligns with other progressive ideas that see learning as a rich, lifewide and lifelong, authentic and self-determined experience in which formal provision is only a part. Mobile learning disrupts pragmatic thinking that positions education simply as a provided service or that positions the learner as an impassive consumer of that service.

Herrington *et al.* (2009) recognise how mobile technology makes authentic learning possible by providing access to real-world problems, challenges, investigations and explorations. They capture this in a set of principles which summarise learning as: being relevant to the real world; supporting the need to learn on the move; creating access and time to explore knowledge; blending the physical and digital space; providing temporal, spatial and interpersonal flexibility; making learning more personal; and mediating the production of knowledge.

This proposition for mobile authentic learning positions the student as a critical explorer testing the validity of theory and knowledge as they use or develop it further, and as they foster lifewide and lifelong learning habits.

10.3 The learner-generated context

Luckin *et al.* (2011, p. 73) offer the concept of 'learner-generated contexts' as defining learning situations constructed by the learner, particularly where they are social and focusing on the 'combination of interactions a learner experiences across multiple physical spaces and times'. A learner-generated context is

> *a context created by people interacting together with a common, self-defined learning goal. The key aspect of Learner Generated Contexts is that they are generated through the enterprise of those who would previously have been consumers in a context created for them. (Luckin et al., 2011, pp. 72-73)*

The learner-generated context responds to the affordances of emerging technologies and practice and the need to reimagine the potential learning context. It aligns with connectivism and rhizomatic learning (Siemens, 2008; Cormier, 2008), as it is about 'opening up the process through which knowledge is constructed and understanding is gained' (Luckin *et al.*, 2011, p. 72).

This heutagogical idea of contextualised learning intentionally blurs role boundaries. The learner is the participant designer of their learning, self-determined and able to negotiate what matters. Learner-generated context is interested in developing the capabilities of participants as resourceful individuals and communities able to generate and re-generate, use and validate

knowledge. Context is defined as a set of resources within a learner's ecology. This includes:

- the subject they are learning – how it is recognised and validated by the epistemic community formally and informally;
- the learning environment – the social and physical environments with which the learner interacts and how these are organised;
- the resources – both human (e.g. peers, teachers, parents) and inanimate (media, communications technologies, books, handouts, the World Wide Web, etc.) which allow the learner to access knowledge and information.

10.4 Becoming 'lifewise' and agile in an era of supercomplexity

Our interest in mobility is that it supports a person's experience of learning across space and time, and being liquid in an uncertain world in continuous flux, characterised by its 'supercomplexity' (Barnett, 2010; Savin-Baden, 2015). Supercomplexity is fundamental to higher education today and Barnett says 'we find a sense of individuals having to take responsibility for continually reconstituting themselves through their life span' (Barnett, 2000, pp. 257–258).

10.5 From mobile towards smart hybrid contexts

Mobile learning has always existed in this twilight full of contingency thinking which, even now, can overload and undermine commitment to, and the quality of, new practices and spaces. The case studies provide evidence of uncommon rich and legitimate learning spaces, but highlight how emerging learning spaces are characterised by tensions of adoption as innovative practice is navigated and negotiated. The need for reliable space is in tension with flexibility and possibility: when is the right time to relinquish paper notebooks and accept the benefits and risks of the digital dependence? How do we make the shift from prescribed and provided technological space in favour of tools and places chosen by students (White & Le Cornu, 2011)?

The idea of mobile learning has matured. The swift technical convergence and adoption of distinct handheld devices into smart, connected, multifunctional and ubiquitous devices, is establishing a pervasive personal hybrid learning interface. This is explored in the next chapter, 'Being smart'. It moves the mobile learning discourse from one of impersonal tools to one of a pervasive personalised and situated learning place.

Mobile learning is part of a converging discourse that will be brought into focus in the final chapter, '*Future learning spaces: context and connections'*.

Questions for reflection and discussion

1. The 'field' as a learning space has a tradition in some disciplines as being authentic, immersive and rich. It incorporates real problems that demand resolution, often through peer collaboration. The field also introduces logistical factors that need to be managed. In what ways can you devise similar immersive experiences with your students? What are the logistical implications and risks of using different spaces for you and how can you manage them?
2. The importance of the global learning context continues to grow, being a place of study, a place for study, a source of diverse students and a place for the connected graduate. What opportunities does a global learning space create for you and your students? What are the implications of this space for the design of your curriculum?

Being smart [C4]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Being smart. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 152 - 157). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

The concept of smart learning reacts to the technocentric arguments presented by advocates of mobile learning. It also challenges the hegemony of formally 'provided' physical learning spaces which are assumed to be value-free, but which are nevertheless imbued with inviting affordances and meaning (Withagen *et al*., 2017), constraining learning efficacy by enclosing it.

The advent of ubiquitous personal smart devices helps to focus our attention on the need to develop a learner's agency as negotiator or interrogator of their experience of learning in a connected world. When learning is understood as persistent, connected, permeable and fluid, the presence of personal, portable and connected technologies helps to reset 'situation' as a boundless and multi-dimensional context requiring navigation.

The chapter refers to case studies embedded in other chapters which provide examples of the connected learner being freed from time and place. This points to a hybridity that extends the idea of situation as reaching beyond the 'parochial' allowing us to draw in global contexts for learning.

The lab, the studio and the smart device have implicit meanings and associated cultures which affect the teacher's self-perception and the learner's response. When conceived as nomad, today's learner must constantly reassess their knowledge to facilitate their becoming; a valuable life skill. Education's formal, non-formal and informal open and connected space must be negotiated critically by the learner: the significance of spatial affordances needs to be interrogated, whether that space is perceived to be technical, material or experiential.

Pedagogically, space becomes less structured. It becomes 'unbuilt' and defines the learner, therefore, as essentially 'dis-located' and nomadic. While this freeing up brings new opportunities, it raises questions about learner self-determination and, potentially, alienation having implications for the development of spatial literacy and fluency. How ready is education to support free-ranging, networked, and nomadic learning habits?

[298]

Smart learning conjures up a picture of the self-determined nomadic learner (Alexander, 2004) engaged in nomadic thought (Deleuze & Guattari, 2004), caught up in the flows and eddies that connect to and reach beyond just-in-time formal education.

An education today must prepare the student to engage with the world purposefully across lifewide spaces. In the era of BYOD, learning spans formal and non-formal spaces to accommodate deliberative, reactive, incidental and connective motivations. Learning space becomes fluid as we instinctively make arrangements to meet, check and correct our notes and data, seek help and learning friendship and live our learning in sync with our working by crossing boundaries that were previously impermeable and invisible to education (Brown *et al.*, 1989). Now it seems any space is navigable and this opens a new horizon for the nomadic hybrid learner.

Engaging learners deeply through institutionally provided learning space, whether the classroom or the VLE, remains problematic. Provided learning space is abstract, counter-intuitive and lacks meaning.

This chapter explores connected learning space and creates a picture of the smart learner as navigator, negotiator and nomadic hybrid learner on or off campus. It concludes by sharing thinking from the Bill of Rights and Principles for Learning in the Digital Age (Digital Pedagogy Lab, 2013).

11.1 Smart learning and the digital nomad

This exploration begins by considering the smart device and then looks at its implications for new learning habits.

The smart 'interplace'

Smart devices are portable, multi-functional, highly usable and intuitive, location sensitive and wirelessly connected. The phone, messaging, email, diary, mp3 recorder, media player, games engine, stills and video camera, come together in the smart device as a single, highly functional, portable and personal interface to the world. The smart device's multi-functionality, usability, task-oriented apps, GPS integration and connectivity, converge to create a smart 'interplace': the smart device brings the what, the where, the how and the who

into play to satisfy the intrinsic why of learning. As such, the smart device is a ubiquitous portal to a rich just-in-time multidimensional learning space.

In this smart interplace, educational interest in technology shifts from one of 'tools being applied to specific innovative tasks', to an ontological conception: of being a place for independent and social learning. Not only are we present, but we are connected, active and part of something. As we learn, we find, gather, capture, document, construct and communicate our learning in situ using methods and developing good habits that will hold us in good stead for life. Such an environment demands that knowledge, skills and attitudes are developed in ways that allow the learner to evaluate and apply them effectively. For example, this smart learning space challenges trivial perceptions of social media and clarifies how networking behaviours mature to create rich and highly personalised learning contexts (Luckin *et al.*, 2011). The idea of context moves us on from the technical perception of 'mobile device' to the idea of mobility in its fullest sense of being situated within, indeed at the centre of, our own rich, dynamic and authentic learning network.

11.2 Navigating and negotiating the smart learning space

The learner becomes the active and autonomous navigator of their personally configured space.

Box 25. Multidimensional smart learning space

- data and media rich;
- connected to dynamic interpersonal and data networks;
- augmented and responsive to real situations;
- flexible, versatile and adaptable, temporally or spatially.

The nomadic learner can move between, across and through spaces seamlessly. The technology of space (physical and/or digital) is now increasingly a significant, but background, context to the pursuit of learning and no longer a dominant foreground. The backgrounding, or pervasiveness, of technology allows learning to move out of the abstract and into the real and meaningful. Technological space, as with physical spaces, provides infrastructure, but should not determine our learning behaviour. Nevertheless,

the learner (like any learner) must interrogate their context and explore their agency by discovering the ability to navigate and negotiate their own learning.

The smart learner is on campus, at home, at work or, importantly, in between these spaces. In effect, the learning space becomes ecological and learner-defined by their response to the task they are undertaking and its intended outcomes: the bus becomes the reading space; the café becomes the learning hub; the lecture theatre becomes the backchannel conversation; the garden becomes the place for chat; the office becomes a place of study. Learning for the smart learner is situated in life and learning space becomes a personal, mutable, and permeable bubble.

11.3 Personalisation and invested learning

The phenomenon of smart learning makes the context for engaging in study more personal and promotes and necessitates greater self-direction by offering more open, connected and augmented learning experiences.

The idea of 'personalisable' smart interface means more than the ability to customise your phone: instead, each device is understood as it is adapted by its owner to suit their context. For example, in an active classroom the device becomes the camera, the network and the storage interface in immediate succession as the photograph of the whiteboard is captured for later sharing and review by a learning set. Smart learning is characterised by the seamless integration of behaviours including those that involve technology.

A provided learning context or space (e.g. a loaned iPad; a classroom in which a student has no voice; a concept that remains cognitively 'unsituated'; a task that offers no learning purchase) remains inherently alien until the learner can invest themselves in it. In designing any learning space, whether the space is physical, digital, conceptual or experiential, the goal of the learner should be to make it a place of learning imbued with meaning. The student has a greater investment in their learning where they accept responsibility for making and navigating their own learning space. Their cognitive, temporal, spatial, and even financial investment becomes part of their commitment to learning. This idea of invested learning is about how the learner claims agency and establishes and

analyses their task, accepts, risks, commits to spending time on-task, and learns to adopt professional attitudes.

Our learners need to know and experience what real, lifelong learning feels like for them to invest in learning habits. The student's own smart device, when understood as a personalised learning place, increases their sense of independence, control and responsibility for their own learning. Smart learning involves a form of digital placemaking.

11.4 The nomadic hybrid learner and the new learning paradigm

Smart learning reassesses dependency on the conception of space as container; as being prescribed, provided and bounded:

> *Nomads must continuously readapt themselves to the open-ended world in which even the line of horizon may be affected by the changing conditions of wind, shifting sands or storms so that no single rule of knowing that would ever assist nomads in their navigations, perhaps only knowing how would. Semetsky (2004, p.447) cited in Mejias (2005)*

Deleuzian philosophy describes 'nomad thought' as the constant re- orientation of knowledge that facilitates becoming. In this philosophy, knowledge is accepted as uncertain and impossible to construct and learning as a continuous state of becoming: once knowledge is understood, its construction is exposed as being incomplete and contextually determined, and is experienced as being dynamic. Even where the learner remains ready to accept knowledge as absolute or where they are ready to work with it in a transitional way, the curious learner will not be satisfied by the knowledge they have grasped (Baxter Magolda, 2004). Every book and every action only raises more questions for the curious, committed and reflective learner. Connectivists make the point that (Cormier, 2008), as we think about what is different about learning in the digital-social age, we can never depend on the validity of knowledge: what appears to be solid is likely to melt into air as we cross intellectual thresholds and, if it does not fade or morph immediately, the contextual borders or horizons that frame our knowing become redefined as we approach them.

In Alexander's article Going Nomadic, he asked, 'What does a campus look like when students are accustomed to reaching the Internet from wherever they stand, stroll, or lounge?' (2004, pp. 30–31) 'Should our physically sedentary

campuses embrace the digitally nomadic swarms of arriving students?' (*ibid*, p. 34). In his view, it would be the nomads who would build a new civilisation, not the imperial city-dwellers of the existing paradigm. He argued that we should look to our learners to understand the learning paradigm.

11.5 Constructing unbuilt pedagogy: heutagogy and the learner-generated context

Despite having apps for accessing the university learning management system, the library, and other perfunctory spaces, higher education has not yet grasped the implications of the nomadic learner. Teaching looks remarkably similar to how it has always looked; the integrated use of mobile technology for teaching within our learning spaces remains largely absent. But then, whose role is it to look after the unbuilt space of the nomadic learner? How is independent, nomadic, technology-rich blended learning promoted and accommodated? How are universities strategically developing non-formal spaces as places of learning? Universities tend to be organised to support more familiar and manageable forms of learning. How ready are we to support free-ranging, networked, and nomadic learning habits that pre-empt engaging professional behaviours? A positive and imaginative view of heutagogical 'dis-location' is needed.

In the meantime, students are as wedded to their devices on campus as they are elsewhere; at least when they are out of class. They intrinsically use their devices and social media to organise themselves and to construct useful transient spaces for mutually beneficial networked learning (see the Charlotte Burton, Sarah Smith, and Beryl Jones case studies, nos 15, 16 and 22). Almost instinctively, they create networked behaviours that criss-cross through the augmented experience of the physical-digital hybrid space.

11.6 A bill of rights for hybrid learning

Leading innovators exploring this world of the resilient lifewide, lifelong and global learner have developed a Bill of Rights and Principles for Learning in the Digital Age (Digital Pedagogy Lab, 2013). Its purpose is to help educators form a better response to the needs of students in a global, interactive, digitally connected world. It creates a manifesto to challenge our thinking about learners

and their learning. ‘Online learning,’ it says, ‘represents a powerful and potentially awe-inspiring opportunity to make new forms of learning available to all students worldwide, whether young or old, learning for credit, self-improvement, employment, or just pleasure.’

Its principal ideas describe hybrid learning as being ‘freed from time and place’, being connected ‘to multiple locations around the world and not tethered exclusively to the digital realm’. This attitude is found in the Johnston, Eddy, Sarah Smith, and Wilmot and Rushton case studies. A hybrid learning model structured around real-world problems, apprenticeships and internships can be used to deliver this. They say the context for learning need no longer be local and parochial; our connectivity allows our thinking to be situated globally, making use of diverse histories. The shape, depth and size of learning can be flexible and determined by the learner’s own needs, reflecting some of the principles evident in the design of MOOCs and radical adult learning paradigms. Learning is a persistent state, being emergent and a lifelong pursuit. It no longer needs to be ‘relegated to the brick walls of an institution’ or specific points in a person’s life. Learning can be assessed, but this is not what defines it. It should seek to be innovative in its pedagogies, methods, tools, and modes. It should transform assessment into ‘a rich, learner-orientated feedback system’, being formative in intent rather than being summatively driven. The principle of play should be used to guide the design of learning to be experiential and unpredictable thereby developing learner agility and capability to address the unexpected. Learning spaces should promote civility, encouraging interactivity, collaboration, and exchange (Digital Pedagogy Lab, 2013).

11.7 Conclusion

This chapter has been full of questions and there are many others that could be asked. I suggest that the answers to them will be diverse, representing a necessarily eclectic view of higher education. However, it seems that the very idea of university may be changing fundamentally to become a space for nurturing professional attitudes and capabilities; a smart ‘nursery’ for developing and replenishing knowledge, skills and professional dispositions.

Questions for reflection and discussion

1. How, and to what extent, should you and your students embrace these new possibilities for learning in a connected world?
2. How do does ubiquitous connectivity change your thinking about learning content and context, and what are the advantages and challenges of this to you and your students?

Being rich: learning in the age of *YouTube* [C5]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Being rich: learning in the age of YouTube. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 158 - 171). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

The pedagogic concept of media interventions shows how rich media provide alternative ways in education of representing information, describing processes, explaining concepts, asking questions, establishing problems and scenarios, giving feedback, telling stories, and establishing context. It reflects many of the qualities of a hybrid learning studio as a personalised place of connection-making, co-operation, authentic endeavour, and ambiguity. Acts of learning become situated and agentic. The richness of media, more than simply its digital properties, encapsulates ideas about place, being ill-structured and non-formal, personalised and full of presence, unbounded and connected, embodied and enacted, and lived through co-operation.

The case studies in this chapter show how media production can be used to create high levels of student motivation and interactivity. Authentic learning experiences move beyond abstracted thinking to "'really doing' the subject" and are often the basis of media-enhanced learning activities. Through co-creation, students collaborate in acts of design and decision-making which involve research, selection, sorting, structuring, presenting and defending knowledge. No longer the recipients of presented knowledge, students are challenged to engage real-world audiences or engage with external partners. Such involvement can be highly motivational and help to foster disciplinary identities. Authenticity is also found in situations in which the learner-producer acts as pioneer of uncharted territories navigating "the wild open." Common to studio disciplines, the unbounded and connected nature of digital media challenges makes media-enhanced learning open, accessible and rich for any student.

Digital media disrupts traditional conceptions of bounded learning space. Digital media is intrinsically fuzzy, ambiguous and requiring interpretation. The richness of the experience creates authenticities through the ways ideas are represented and in how acts of learning are experienced by the learner and the teacher as users and produces involved in deeply interrogating knowledge together.

[289]

This chapter considers the qualities of a rich media-enhanced experience. It challenges the over-dependence of academic practice on written texts, arguing that it is anachronistic. The written word, in its many forms, has proven to be a highly flexible medium for academic purposes, and will remain so. However, the continued dominance of the written word in academic practice indicates a lack of awareness amongst academics, or their lack of confidence, about media-enhanced learning and its rich possibilities.

In this chapter, we consider how rich, multidimensional digital media can be used to engage academics and their students to interact more deeply and with greater authenticity. It considers how digital media, such as video, images, audio, infographics and embedded interactive devices such as animations, timelines or multimedia quizzes, are used to enhance and, in some cases, transform learning.

The chapter begins by introducing the concept of media-enhanced learning and offers exemplars of how this can be used to enrich teaching and learning. It then looks at media-enhanced learning as it is experienced through three case studies, noting their relationship to smart learning and the use of social media.

12.1 Media-enhanced learning

Media-enhanced learning describes practices that exploit the diverse qualities of digital media and their application for creating a rich learning space.

Without access to pervasive smart technologies, academic practice incorporating rich digital media would have required the involvement of technicians using specialist tools and skills. This dependency makes such practice impossible to scale and sustain. However, these technical limitations have changed markedly; at the same time, extant disciplinary methods, accepted academic protocols, longstanding habits and expectations are ingrained. Normal digital life beyond the university has been less bound by tradition and has embraced rich media, albeit often uncritically, while academia has been slower to respond to the advantages of the new media landscape.

Capturing, editing and distributing reasonably high-quality digital media today using smart devices is technically easy to do and accessible. Many of us

regularly use rich media on *Facebook*, in *Twitter* streams, *YouTube* channels, and other online sites.

Rich media provide alternative ways of representing information, describing processes, explaining concepts, asking questions, establishing problems and scenarios, giving feedback, telling stories and providing context. Sometimes rich media interventions, like Gary Wood's Linguistics case study (no. 20), are highly considered; sometimes they are expedient as in the case of Anne Nortcliffe's innovative approaches with audio (case study no. 9). Sometimes they are intuitive and spontaneous, as is evident in the Snapchat case study in this chapter. And often they are impulsive and inspirational as in #DS106 (see Viv Rolfe's study, case study no. 7).

Graphic media, for example, are used to visualise knowledge by mapping out information conceptually, presenting statistical information as graphs to clarify relationships and simplify complexities. Charts and diagrams present the flow of processes, describing objects, illustrating conundrums, or telling stories. Tversky (2003 notes that graphics attract attention, support memory, provide models, and facilitate inference and discovery. Similarly, audio, video and other time-based media can be used to represent processes, perspectives, narratives and feedback.

Rich digital media can also be used inductively to tease open thinking and stimulate deep learning by representing the world literally, conceptually or metaphorically. When made by the learner, individually or collaboratively, rich media open a vast creative space full of rewarding challenges and opportunities that promote possibility thinking (Craft, 2010).

Opportunities and possibilities alone are not enough, however. It is unmet needs that convince us to be innovative (Miller, 2009). Learning media, therefore, orientate, motivate, challenge and provide feedback to the learner through media interventions which afford new rich pedagogic strategies (Middleton, 2013).

Box 26. Addressing academic needs through media interventions

Learning with rich media supports academic outcomes in which there is a need to:

- heighten the authenticity of knowledge and experience;
- value uncertainty and ambiguity, as well as contextualised acuity, in knowledge;
- enhance learning context, meaning and relevance;
- motivate students by extending the space and methods for engaging deeply in their learning;
- develop digital literacies by practising in digital contexts;
- develop professional capabilities including creative and critical thinking by exploiting the qualities of media;
- reflect the richness of the global context within our learning spaces;
- develop effective lifelong habits and identities.

Media interventions are deductive or inductive. In deductive methods, learning responds to knowledge conveyed by the media. In inductive interventions, the experience of producing media generates learning. In each case, media is used to situate learning in a richer context. For example, media can be used to heighten the authenticity of an idea or problem, or create breadth for the learner to negotiate an assignment brief.

In learner-generated activities, the tangential learning objective of producing an artefact supports collaboration which allows each participant to 'try on a role' involving them in making and responding to judgements, as well as reflecting on their own performance by observing their peers (Bandura, 1977). This is evident in two of the case studies here and in a task such as producing a team podcast that involves the co-production of knowledge through enquiry-based learning.

12.2 New media-enhanced learning spaces

Audio and video are versatile media (Middleton, 2016, 2015b, 2013). Unconstrained by time or place, they establish new types of learning spaces rich in social presence. They create spaces for listening and watching, enquiry, generative activity, speaking, showing, and learner co-production. An analysis of audio pedagogies in the digital age shows how academic audio, for example, can be used to supplement, augment, modify or redefine pedagogy (Middleton, 2016). It is used for:

- **New activity types** — establishing new forms of learning activity through the creation of new task types that were previously inconceivable;

- **Connected activity** — extends activity, often involving people not directly associated with the module or the university, also leading to new task types that were previously inconceivable;
- **Relocated activity** — relocates activities temporally and spatially allowing for significant task redesign;
- **Captured activity** — promotes re-engagement with an activity that previously was ephemeral in nature.

12.3 Inclusive media practice

Media-enhanced learning promotes inclusivity by providing academics with further options for engaging their students. Audio, surprisingly for some, is often helpful for deaf students. Most deaf people have residual hearing, with only a small percentage being profoundly deaf. Audio recordings, therefore, allow learners to revisit what was said. The option to revisit learning events by 'replaying' them through recordings can promote in-class engagement and confidence for international, dyslexic and deaf students who, without recorded notes, can become overloaded trying to keep up. The use of videos and photographs, captured by systems, tutor or students, can also aid confident engagement.

Some people assume that recordings need to be transcribed 'to be accessible', but this is a reductionist misconception and a barrier to good inclusive academic practice which should accommodate all students in equivalent learning experiences to achieve common outcomes. Equivalent experiences here mean one or more activities that allow each learner to derive equivalent learning value. The logic of transcribing experience comes from the assumption that learning is dependent on transmitted knowledge, with the implication that media are used for transmitting it. This is not the academic view of media in which media are used to mediate learning, deductively or inductively and enrich the development of knowledge through experience.

The implication of this assumption goes beyond digital media and leads to a reductive view of any mediating learning space, especially in an active and experiential learning paradigm. Inclusive practitioners look closely and

imaginatively at how they engage all their learners, and expanding the range of media can support this (Figure 12.1).

Box 12.2 How media-enhanced learning promotes inclusivity

It increases access to,

- authentic situations;
- diverse methods;
- opportunities for the deduction, induction and production of a wide range of learning responses.

12.4 Developing motivation in a media-enhanced space

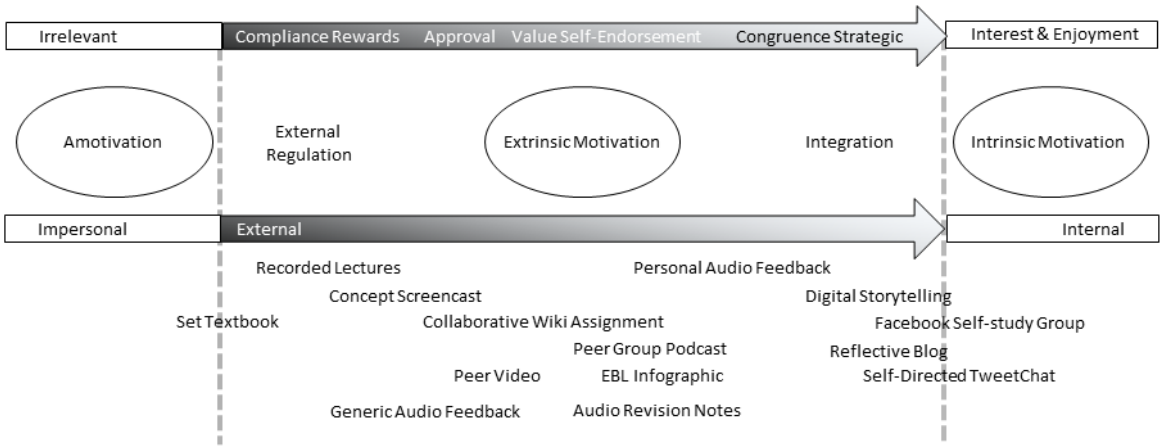


Figure 12.1 Media-enhanced learning and motivation in Ryan & Deci's (2000a, p. 72) Self-Determination Continuum Showing Types of Motivation with their Regulatory Styles, Loci of Causality, and Corresponding Processes

Thinking about the 'intangible' dimensions of the learning space including spatial significance and the relationships of virtual and built environments is integral to establishing a successful learning environment (Blackmore *et al.*, 2011).

Digital media offer new affective dimensions which can foster motivation and engagement. Ryan and Deci (2000a) explain that intrinsic motivation stems from internal needs, which are essential for growth and social development. They say, 'Most people show considerable effort, agency, and commitment in their lives' (*ibid*, p. 68), being naturally curious and selfmotivated. Learning through communication, creativity and collaboration with digital-social media is concordant with the intrinsic personal impulse to respond to situations.

The constructed pedagogy (rather than simply 'built' pedagogy) of media space affects engagement and learning. We need to think, then, about the constructed characteristics of rich media learning space.

12.5 Personalisation in media-enhanced space

Personal context is key to understanding rich situatedness. Personalised learning space promotes self-realisation, self-enhancement and self-development and can enhance retention and satisfaction (Leadbetter, 2005). Personalisation stems from how relationships between students and tutors, and amongst peers, are fostered (Brookes & Becket, 2009). The judicious use of technology can enhance face-to-face interaction with tutors to create a supportive space; however, institutionally provided technologies are often seen as dehumanising and deterministic (Kandiko & Mawer, 2013). Conversely, rich and social media, especially when they incorporate teaching and learning voices, can be used to add a humanising layer to learning spaces (Selwyn, 2013; Middleton, 2013).

Audio feedback and personalisation

Audio feedback is one example of how digital media can personalise learning. Its use demonstrates the adaptability of media-enhanced pedagogy and how it can be easily tailored to respond to a student's learning context to clarify communication and heighten meaning, thereby personalising learning (e.g. Laughton, 2013; Gould & Day, 2013; Olesova & Richardson, 2011; Middleton *et al.*, 2009; Davies *et al.*, 2009; Davis & Ryder, 2009).

Audio feedback can be defined as the use of recorded voice to provide formative or summative feedback on a student's work. It is usually produced by the tutor, though student peers, and others, can produce feedback on learning activity and its products. It can be made using desktop software such as Audacity with a headset or by using mobile devices, especially smart devices and apps like Voice Record with options for managing and distributing recordings. Technically audio feedback is easy to make: it involves pressing a record button, talking, pausing as necessary, stopping the recording, and finally saving and sharing the audio file.

This makes it not only rich but fast to produce, addressing demands for the quick turn-around of high-quality fit-for-purpose feedback on students' work (Laughton, 2013) and the need for feedback that is constructive, motivational, personal, manageable and directly related to assessment criteria and learning outcomes (Hatziapostolou & Paraskakis, 2010).

Audio feedback works best to clearly communicate with the learner one-to-one, clarifying strengths and weaknesses in a supportive and encouraging way, and setting out specific actions. It works particularly well to summarise feedback using a natural voice. Audio feedback demonstrates the tutor's personal interest in and familiarity with the student's work. The supportive academic voice brings out meaning when there is a need to communicate key messages, and it is also highly flexible and capable of integrating real-time commentaries on performances using a video app like Coach's Eye.

Audio feedback is different from written feedback; not necessarily a replacement. Some practitioners, such as Cavanaugh and Song (2014), have compared the two as being equivalent; however, any media need to be understood and selected for their particular qualities, which can be used to complement other approaches.

Beyond feedback, the same techniques can be used in one-to-many situations including providing audio announcements, assignment briefings, FAQs and summaries which allow the tutor to personalise the learning space with timely formative interventions (Middleton, 2015b). This flexible view of media challenges reductionist attitudes to using media pedagogically, revealing new dimensions and opportunities in the media space.

Digital Storytelling, digital narratives, video abstracts and digital portfolios

Story-making and reflective learning have an obvious affinity (Jenkins & Gravestock, 2009; Jenkins & Lonsdale, 2008). Digital storytelling is a versatile approach used for producing short personal multimedia narratives. It was originally developed by the Center for Digital Storytelling to develop reflective practice (Lambert, 2009; Meadows & Kidd, 2009) and has many applications for university learning beyond the original story form.

Technically, digital stories are brief and combine spoken narrative with images which are usually saved in video format. Some stories include music and annotations, but there is no need to prescribe methods or media types; the essential principle is that anyone can learn to produce such multimedia presentations using common ICT skills (for example, see http://ds106.us/).

As evocative reflective pieces, digital stories exemplify how media can be montaged in an interplay of voice and literal or metaphorical visual media.

Box 28. Applications for digital storytelling in higher education

Applications include,

- **Reflective accounts** – development of reflective skills around key learning activities, sometimes forming a portfolio for assessment (see case study no. 19), e.g. project stages, field trips, work-based learning context, etc.;
- **Video abstract** – a more descriptive and presentational approach, the method can be used to introduce and summarise a larger piece of work such as an essay. The technique develops communication skills, can complement a written report, or replace a face-to-face presentation (see how Toby Carter's student created the The Grey Seal and the Fisherman story in Storify in case study no. 10);
- **Case study knowledge object** – an explanatory piece produced by a student group to present key findings or knowledge complementing similar products from other student groups (see Gary Wood's case study AllAboutLinguistics (no. 20). The artefact can be targeted at peers, real-world audiences, less experienced students, clients, employers or other 'publics';
- **Digital portfolios or showreels** – the serial presentation of visual media such as student work with a personal commentary offers a flexible assessment piece with further benefits for student employability;
- **Deconstruction piece** – a short commentary piece deconstructing and analysing a single piece of work using visual records captured during a project can help the learner analyse and value process over product;
- **Context setting for active learning** – orienting learners to topics in flipped classes or assignment briefs;
- **Digital scenarios for problem-based learning and digital case-based learning** – scenarios describing key actors, settings, circumstances, and evidence can be presented as media narratives. Students can return to these short videos as reference points as they work through tasks on or offline.

Rich digital media, when used well, are essentially learner-centred, reaching across and beyond formal spaces to create unbounded personal learning experiences. Designing media-enhanced learning offers greater access to a

richer, more responsive space, strengthening presence and connection to the people who define their experience.

Case study: Allaboutlinguistics.com learner-generated online learning resource

Subject: Gary Wood

AllAboutLinguistics.com is a rich web resource used by over 35,000 people a month. It was constructed in *Google Sites* by approximately 70 first year undergraduates studying English at the University of Sheffield.

Gary Wood says he wanted to engage his students deeply by co-producing a resource with real-world value, challenging the tendency of students to be driven by assessment:

> *It actually really motivated them. One student said to me that she'd put a lot more work into this. She was not unique. All the students had and it was worthwhile to her because she felt like she was helping [A Level] students solve a real problem … rather than, as she expressed it, writing an essay that would sit in a drawer and gather dust.*

In their first semester, students attended 'taster' lectures delivered by academic colleagues with different research specialisms. Based on these, students selected a research topic for incorporation into the site which they developed in small groups during the second semester. The students were expected to examine current research and produce a core topic page using an outline structure provided by Gary. This ensured that the overall site would be coherent and the task consistent. Students could choose to add further pages to explore their topic in more detail. The assignment required the students to use web media creatively, clearly and concisely to communicate what they had learnt and it took Gary no more than 10 minutes at the end of a lecture to introduce the students to *Google Sites*: 'That was all I had to do … Then they developed their own approach to creating the pages and developing their research areas.'

Google Sites allowed Gary to check that everyone had engaged, and he could monitor project progress and student contributions. Gary says that

Once they got started there was actually a much more even distribution of work within groups than I've seen in other group projects. I said to them that a website should not just be an essay with pictures in it. What we didn't want was to do the kind of thing they would normally do when writing an essay ... We expected to see hyperlinks between topic areas and to external sites as well.

Gary stresses that the students were primarily engaged in studying Linguistics and there was never a point at which they moved into becoming web designers:

I didn't want the students to move away from the subject. I wanted them to be exploring it and developing it, but at the same time they were having to engage with a real external audience to communicate that knowledge and to communicate their own learning and understanding of the topic they'd been studying.

The students could access support on producing video content, podcasts, screencasts and using images from the university's creative media computing service, but most did not use the service: 'I think they realised they had the technology already to film with their iPhone or to record audio at a good enough quality.'

The approach encouraged a race to the top in terms of quality due to the project's visibility. Students could review the entire site to make connections across topics. While making connections was included as an assessment criterion, it also aided student motivation and peer feedback due to their commitment to developing the site's usability and value.

Students went off and found things like YouTube, or they found a tool called Dipity [http://www.dipity.com/] to build interactive timelines, and a whole range of things … Once one group used a particular tool, then other groups would use it too.

Gary observed a co-operative spirit and pride in the site across the cohort: 'At the end of the five-week development, very little editing was needed before the site could be published.' It became clear later how important this had been when Gary discovered how his students were actively promoting it. Schools and sixth form colleges started to use the site because his

students had taken it upon themselves to show the work to their former schools.

Gary says students did not really see it as an assessment task:

> *Usually with groupwork you have students come in and complain that students aren't really contributing … or they constantly want to know what grade they're going to get. That completely disappeared in this project … They recognised that if they produced something that was of value for the audience they were aiming this at, then good grades would fall out of that. Similarly, formative and summative feedback took less time, being integrated in a timely way throughout the project with students using it to improve their end of project report.*

The assessment criteria addressed the content, its clarity, the appropriate use of media, and the connections students made to each other's work. Inaccuracies in content were identified by the tutors during the submission process and students were given feedback to make changes prior to the launch of the site. 'Students were willing to make those changes even though they knew it would not make any difference to their grade. This to them was never about their grade, it was about the end-product.'

The original version of the All About Linguistics site is still accessible via http:// aal.garywood.me.uk.

Case study: TeachMeAnatomy

Subjects: Ollie Jones and Terese Bird

The TeachMeAnatomy website (http://teachmeanatomy.info/) is a free to use online 'virtual textbook' of anatomical knowledge. It includes over 320 topics and 700 anatomical images. Built using WordPress, it is an Open Educational Resource (OER) produced by Oliver Jones with the support of peers, anatomists and doctors while studying as a student at Leicester Medical School.

Like his peers, Ollie says he hardly uses print-based textbooks, yet there was nothing in the form of an online textbook on anatomy and this gave him the idea of developing TeachMeAnatomy: 'I wanted it … it was just really what I thought would work.'

Terese Bird, an Educational Designer in the Medical School, and Ollie describe a runaway success story: the site currently receives up to 44,000 daily worldwide views and a million visits a month. It also receives about 500 comments a month, giving Ollie useful feedback.

The development sits outside of the curriculum, being a self-initiated, studentled project, but the building of this medical encyclopaedia has provided a rich learning experience that reveals much about student motivation, peer co- operation, authentic learning and the role of content.

Ollie began to build the site in his first year. He says that developing the site is very motivating. It's really nice checking how many people are visiting the site. Getting positive comments through. Although the commitment has grown as the site's got bigger ... that's what keeps me interested.

Ollie is acutely aware that the quality of the information he provides is critical and he acknowledges the difficulties of assuring the content's quality when you are still learning. He has involved many senior academics and doctors to validate the site, but this needs to be managed carefully. Terese notes that academic staff can be reluctant to become involved in student-led learning initiatives. In reference to another initiative in which students generated a revision resource, Terese noted that peers needed assurance about the reliability of information and staff felt under pressure to check the quality of student content. She says the danger is that the best intentions can unwittingly unravel.

Ollie put out a call through *Facebook* and email for fellow students to contribute following its initial success. About 12 responded. They had used the site, understood its purpose, and were keen to get involved. Ollie says student peers are motivated because involvement looks good on their CV, provides networking opportunities, and they want to be associated with and build upon its success. He is now leading further teams of fellow students and junior doctors writing material for new sites on surgery, obstetrics and physiology.

The project exemplifies the creation of a new student-led space; one that conceptually positions the student in a bridging space between the formal relationship they have with being at university, and all that that affords, and the professional world of

medical practice. This in-between space motivates the student by testing and developing their knowledge in an authentic situation. By being involved, the students can do something that matters to the world while being close enough to the safety and support of their academic environment to ameliorate the risks of learning in 'the wild'. Potentially, this is an educational sweet spot.

Social media, such as WordPress, make it easy for students to venture into an open 'wild' space that stands apart from the formal regulated space of university, while being adjacent to the regulated space of the professions. Though rich, it is a relatively uncharted space. The student experiences multiple identities of the learner, novice, and expert; the 'becoming professional'. And this can enhance their confidence, self-esteem and motivation.

Ollie acknowledges that editing and managing the quality of online encyclopaedias takes an inordinate amount of time! However, he remains highly motivated and notes the benefits of having to closely read nearly everything that is published on TeachMeAnatomy:

> *If I was just interested in learning material I'm sure there would be more effective ways of spending my time ... I am interested in medical education, so there are benefits of being able to learn material as I go along and it has also opened up my eyes to other parts of medicine that I might like to get involved with in the future.*

Ollie is now practising as a junior doctor.

Case study 22: Anonymous engagement through Snapchat interaction

Subject: Beryl Jones

Beryl Jones, an academic in the School of Computer Science & Mathematics at Kingston University, has been using Snapchat to engage her students in her lectures. She has large classes of Level 5 (n. 206) and Level 6 (n. 96) students for her Database modules and she is committed to understanding how the everyday social media her students use can be adapted to develop their engagement.

Beryl has been trying to find a way to encourage students to ask questions in large group settings. Student questioning helps the lecturer to gauge student comprehension, but she has found it

difficult to achieve a sufficient level of interaction in large classes. She describes how her students either sit at the front or 'plonk themselves at the back of the lecture theatre'. Interaction, she says, breaks down the barriers between the lecturer and those students who feel less involved or more reluctant to engage:

> *The problem that I have is the students sitting at the back in the lecture theatre. Getting those students to engage. All the kids at the front, in a couple of weeks, we know their names and those at the front are always asking questions.*

She has had some success using Socrative, the class voting app, but realised by observing her own teenage children that Snapchat had begun to dominate their social media habits. Initially she was dismissive of it, but having spoken to one of her final year project students she discovered that they were all using Snapchat. It was not just a teenage fad:

> *When I saw what my teenage daughter was doing I thought, 'What a load of rubbish!' They're taking pictures, scribbling something, what I'm having for dinner…, 'I love you!'… and sending it. And she was getting just as much rubbish as she was sending out.*
>
> *But then I thought, I can use this in the classroom because the students who are sitting right at the back of the lecture theatre can send me a question through Snapchat.*

Snapchat is a social media application used to share photos, videos, text and drawings. Beryl explains, 'You can take a picture or take a video lasting about 10 seconds. You can set how long the video is. Or you can just send text as if it was a message. A snap or video can only be viewed for up to 10 seconds and then it disappears. If you don't open it within 24 hours you can't see it.'

As learning technologies go, Snapchat is simple functionally. However, in class, it becomes a messaging app opening up a discrete communication channel using annotated photographs for students needing clarification on what is being taught.

Beryl's lectures last two hours but she gives everyone a break after one. 'I say, "Does anyone have any questions?" ... So they send me this: "Can you explain many-to-many and many-to-1. Thanks. :-)".'

Beryl's lecture slides rely heavily on the use of diagrams. She shows me a handwritten Snapchat message. Others use text input:

> *The students were taking screenshots of my slides whilst in the classroom and annotating the snaps before sending them to me. Some would use this practice to question something they didn't understand and others to answer questions being asked. I really enjoy that I can send them a question or they can look at what I am teaching and they take a picture and can annotate it.*

Beryl says opening the messages was fiddly at first. She lost a few and had to ask for them to be re-sent: 'You really need to concentrate when you open it as photo and video messages can only be viewed once and initially it took me a while to get used to this.' There was a short learning curve, but she has learnt to take screenshots of the photos before they disappear.

Beryl explains that the students don't have to put their hand up now: 'The ones at the back will never put their hands up anyway. Or some students are embarrassed to put their hands up.' Snapchat is completely anonymous and she likes the immediacy of the feedback she receives and can give her students.

12.6 The benefits of rich media-enhanced learning

A successful rich media learning experience can be defined by high levels of student motivation, interactivity, peer co-operation, and an appreciation that content is disputable and demands critical engagement.

Although it was not immediately obvious to Gary Wood's students, the pedagogic rationale behind the Linguistics project required his students to select, sort and structure knowledge, and then interrogate it through research, writing and media production activities. They had to engage with each of the topics so they could make informed judgements at an early stage. They then had to develop and interrogate their own knowledge to design their enquiry with their collaborators. His students produced digital graphics, photographs, audio, video, screencasts and timelines; all media embedded in hyperlinked page structures connected across topic areas. Manipulating this required them to have a deep understanding of their topics.

Peer co-operation

The processing of co-produced content creates continuous opportunities for reflection and feedback. These are multiplied when collaborating with peers.

Authentic drivers

Sambell *et al.* (2013) describe authentic assessment design as vitally important. Students feel as though they are 'really doing' the subject and this helps to foster disciplinary identities that remove students from simply 'being students'. They note that some students excel academically because they are better at writing assignments, yet they say writing has little to do with knowledge synthesis or developing a voice. 'Real world' audiences, as opposed to purely academic audiences bring out believable qualities that are usually not present in purely academic tasks. Authentic tasks have layers of meaning that enhance student engagement with them. Students can achieve extraordinary feats if they have good reason to do so. In the Linguistics and Teach- MeAnatomy cases, the students were highly motivated, being immersed in their research and demonstrating their expertise to themselves and others by applying their acquired specialist knowledge in real-world situations.

Students usually have an innate desire to do well. Gary's students could estimate the quality of their own work by ensuring its usefulness for their real-world audience. For Ollie, assuring the quality of his work was an issue which he resolved by tapping into professional networks and by taking on board the feedback he received from site visitors. His decision to apply a Creative Commons licence to TeachMeAnatomy promoted its reuse while being a statement of his faith in its quality. Similarly, the Linguistics assignment created a co-operative 'race to the top'; a positive competition among students to stretch one another by sharing and benchmarking their work.

For Gary, managing the assignment as it is produced before your eyes and being able to give just-in-time feedback challenges some of the concerns about the quality of feedback in higher education.

12.7 Navigating the 'wild open'

There is a sense of 'learning in the wild' in these studies that comes from creating and exploring unconventional space and a renegotiation of both the

academic and student role. In each case, challenges about managing quality and safety in ill-defined, unpredictable and rich contexts were managed and, instead, attention was given to the immense value of learning in spaces constructed by the students. For Beryl Jones, an academic innovator, the risk may be more about teaching in the wild; opening connections that become difficult to manage. Nevertheless, for her the impact of being accessible and responsive in and out of class means such risks are worth managing.

The digital space is expansive and ripe for innovation. Media integration can be remarkably powerful and simple. Media-enhanced learning incorporates media that can be harnessed to engage students through orientation, intrinsically motivating and challenging learning activities, or as a space for feedback, reflection and connection making. Learning media can be used effectively to support deductive or inductive pedagogies: the latter generative methods bring the learner's voice and identity to the fore, especially where learning is a process of negotiation with co-producers.

The possibilities grow when rich media, social media and the use of personal and mobile technologies combine to promote media-enhanced learning.

Questions for reflection and discussion

1. Rich digital media creates a different type of space to the written text. The opportunities it creates for the academic or the student to think in new ways about their discipline and themselves are innumerable. Identify two or three techniques from this chapter or from your own experience. How can you adapt them to suit your context? For each one, identify the challenges it presents and who can help you solve each challenge.
2. A key theme in this book is learning as placemaking by promoting learner agency and co-production. How can your students use digital media to personalise their experience of learning by using and making digital media?

Being there: active learning spaces [C6]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Being there: active learning spaces. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 172 - 193). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

The chapter examines learning spaces designed to support active learning. The case studies focus on the art and design studio and the SCALE-UP classroom (Beichner, 2008). The former is concerned with openness and fluidity, while the latter is a tightly specified installation that frames collaborative problem-based approaches. In different ways, each set the scene for authentic challenges in which students respond to situations (Brown, 1999) to apply what they know, develop experiments to explore, test and create new knowledge, and make meaning from their experience (Bruner, 1960).

The active classroom is a place of 'becoming' in which learning involves acts of placemaking: learning, and the knowledge it produces, is ontological. This is most evident in the studio as a place of mixed formalities, functions and zones: it is a home space, a laboratory, a workshop, a classroom, a meeting place, a gallery. It is ambiguous and paradoxical, being open, student-centred and social. It is a learner-generated context (Luckin *et al.*, 2011), a place of both process and product mediated by analogue and digital technologies and media. It is an intensely personal, personalised and contemplative place, a place of performance, being interactive, social and collaborative. It is a place rooted in traditions while being concerned with imagined futures. It is intentionally playful and inherently disruptive, reflecting and reinforcing its traditions and signature pedagogies. It sets the precision of technological processes to the service of complex and ill-formed problems. This interstitial meeting of human and technology leads to the creation of knowledge-based artefacts that define studio-based disciplines. The paradoxes of the studio environment explain hybridity in this thesis.

The studio is an immersive networked place of individual effort, co-operation and co-production; a cauldron of ideas, technologies and people. The chapter asks whether this rich, co-operative learning space has value to other disciplines.

[300]

Students in STEM (Science Technology Engineering & Maths) classes with traditional lecturing are 1.5 times more likely to fail their course than students in classes with active learning (Freeman *et al.*, 2014). Students engaged through modes of active learning can develop higher conceptual understanding and achieve greater success than students engaged in didactic paradigms (Dori & Belcher, 2005). Such statements, combined with what we know about authentic, digital-social age pedagogy and learning habits, demand that higher education looks closely at its built pedagogy and the nature of its commitment to built space.

The active classroom is a place of 'becoming' in which students are motivated through their involvement in work that matters to them. Students learn by building upon and applying what they already know, developing experiments to explore, test and create new knowledge, and by making meaning from their experience (Bruner, 1960). In this setting, learning is as much social as it is cognitive and concrete, and calls for students to continuously make and review decisions by applying what they know to situated problems (Brown, 1999).

Traditional conceptions of classroom, lecture theatre, and other formal learning spaces are being disrupted by the underlying principles of active learning in which the student is the central agent. Ideas of formality are also disrupted as the teacher's role, assumptions about the containment and structuring of learning, classroom design, and the role of technologies, are inverted.

This chapter establishes the principles of the active learning space and offers models which exemplify them. Active learning classrooms, studios, labs, makerspaces and incubators are discussed. In particular, the qualities and pedagogies of the studio are analysed and the concept of the hybrid learning studio is formed. This presents a holistic and versatile model for active learning which can be adopted more widely by universities. The chapter begins with three case studies, each of which challenges assumptions about the positioning of the teacher and student in the active learning space. The case studies feed into a set of new principles for learning in the active classroom.

This first study explores the distinctive qualities of studio as a learning space and how beacon technology can enhance this. The studio is a mystical and under-reported learning space (Dittoe & Porter, 2007). It develops learner autonomy, confidence and a maturity that comes from the student's need to grapple with complexity. The student must be resourceful and self-disciplined because these are the fundamental attributes of the professional studio practitioner.

Case study: Studio-based beacons

Subjects: Kieran McDonald and Ian Glover

This case study explores how beacon technologies can enhance studio-based learning by introducing a digital layer across the studio to create a networked learning space. It looks at the Beacon Project run by Ian Glover, an academic with a background in Software Engineering, and Kieran McDonald, whose role straddles Visual Communication and Teacher Education. Together, they have been exploring the pedagogic potential of the Internet of Things and have used beacon technology with the aim of fostering a strong sense of 'home' and connected learning in the Design studio. The idea of home space emerged as an important principle from student focus groups in Art & Design prior to the development of new studio provision.

Kieran argues that placemaking is part of studio practice. Students personalise their part of the studio to put down some roots.

Ian and Kieran turned to beacons to create a 'just-in-place' digital space. Beacons are discrete, cheap and light Bluetooth transmitters that can push out context-specific information to smart devices nearby. They reflect the fluidity and mixed formality of studio learning. Kieran says his academic role in the studio is also characterised by its fluidity:

> *You move around, facilitate, interject, take comments, ask questions, work with your peers. But then you take out groups into specialised areas and do more formal stuff with them … If I want to find my students or my cohort, there's a good chance that they're going to be thrashing something out in that studio space. And that might be with*

me as an academic passing through or with their peers that come and go.

Kieran talks about a continuous interplay and movement between the workshop spaces and the 'basecamp' space:

[In Visual Communication] we go out to a lab to use specialist equipment. We formulate a design in the studio, we mock up some sketch models. We try and get ourselves in the ballpark and … jump out to those more specialised spaces.

As 'becoming designers', students also told Ian and Kieran they wanted good access to technical information and they wanted to hear more about what inspired their tutors.

Staff requested that the new physical space be left open and uncluttered to enhance its adaptability. Their aim was to enable a responsive pedagogy. Some screens, sofas and a Mac suite of computers were installed on the Visual Communication floor, creating three adjacent zones labelled 'Presentation', 'Collaboration', and 'Production'. These zones were amplified by the siting of three beacons which created a layer across the studio emphasising the students' spatial requirements. Ian explains,

In the Production area, we pushed materials from Lynda.com like videos on how to use Illustrator and InDesign. The tools that they're going to be using. The socialisation area, well it's about collaborative learning, so that was our student-generated showcase area. Then the Presentation zone is more around content from the lecturer.

For the Presentation zone, the lecturers created a *Tumblr* site so that the students could see what they were interested in or working on.

Kieran says the project revealed the studio's cultural dimensions as embodied in its physical and digital space. The three beacon signals intersected in the centre of the floor, replicating how the physical space is traversed by the learner as they transition from one mode of engagement to another, reinforcing the transient quality of studio learning.

Tumblr was used as a gateway to direct the students to online content and engage them in their tutor's research and practice. Instagram became a channel for sharing work, especially to

> support the students to reflect on the two field trips undertaken in the module. In turn, the students noted how this helped them to develop a closer relationship with their tutor.
>
> Kieran says the lead academic valued this new proximity. He told them that he had never been in this grey area between the social, personal and academic space before. This open connectivity introduced some dilemmas for him to do with the act of 'liking' or not 'liking' student work on Instagram, and how this was perceived; nevertheless, he had noticed a definite change in culture.
>
> The use of beacons helped to develop connections initially established on field trips with two professional design studios in London and New York. They had provided real-world assignment briefs for the students and the connectivity from within the studio seemed to contribute to the students' growing sense of professional identity. In particular, their use of social media to maintain relationships facilitated this by creating a trajectory towards real-world practice and graduate life.
>
> "Perhaps most telling was the students' pragmatism about their Blackboard VLE site. The students understood its purpose to be about providing module information, whereas materials delivered through the beacons in the studio were perceived to be more meaningful and about the students' and tutor's disciplinary identity and practices."

The SCALE-UP classroom discussed in the next case study shares some qualities with the studio as an active learning space, though it introduces more structure for supporting large-group problem-based enquiry. SCALE-UP was developed by Professor Rob Beichner at North Carolina State University in the USA (2008) and is similar to other large-group active learning approaches such as MIT's TEAL (Belcher, 2001) and Team-based Learning (Huggins & Stamatel, 2015). It is designed to teach large numbers in a student-centred way and challenges a dependence on lectures by offering a facilitated problem-based approach (Beichner, 2008).

Beichner's idea for active pedagogy informs, and is informed by, the design of the physical space and its technological integration. Most notably the room features large round tables, each accommodating nine students. Table groups can be sub-divided into three groups of three, with each small group sharing a

laptop to work through a series of learning activities. These activities can be interspersed with whole-table or whole-class activities. Students are involved in gathering information, organising their approach, analysing problems, and learning from what they have achieved (GOAL). The space incorporates whiteboards and smaller huddle boards to ensure students are continually interacting around complex problems.

Case study: SCALE-UP

Subject: David Fairhurst

> David Fairhurst is a Physics lecturer using SCALE-UP (Student-Centred Active Learning Environments for Upside-down Pedagogies) at Nottingham Trent University (NTU). He says it is not enough to give students knowledge; students must do something with it. SCALE-UP accommodates this philosophy through preclass enquiry and in-class groupwork, analysis, discussion and conclusion making. The teacher's role in SCALE-UP is the opposite to their role in the lecture theatre, and David notes that this is quite challenging. He explains that the teacher will have prepared the study topic, the pre-class reading or research, the in-class activities and the discussions. They will then lead the session, often with a teaching assistant, by circulating the room, clarifying the activities and opening discussions. Students check and clarify conceptual and procedural knowledge by applying it to problems through small-group work. The model is a rich opportunity, therefore, to develop and apply knowledge, and receive feedback from both peers and tutors in the process.
>
> David says the SCALE-UP rooms in full flow can be very noisy! The two-hour sessions he runs are intense: 'You need good ventilation! It's like a pressure cooker in there!'
>
> The nine SCALE-UP installations at NTU are in high demand. The rooms conform to Beichner's specification, having large round tables accommodating groups of nine students and having integrated and up-to-date technology. David explains that the room is designed to optimise group engagement. 'The round tables are a great size for small 3 × 3 discussions, but full table discussions are also possible, even if the room is busy … There is enough space around so that no one feels crammed in, with space for bags and coats in winter.'

David uses SCALE-UP mostly with his third-year students, but he has introduced it to first years too:

> *We had some good success with first years this year, running a SCALE-UP seminar class directly after the traditional lecture. They worked well in their groups, sometimes using the laptops, but really discussing tough conceptual problems.*

David has introduced SCALE-UP to colleagues from other disciplines. He says SCALE-UP is discipline-agnostic: 'In fact, the Education people have been teaching this way for years and don't know what all the fuss is about. Certainly, within the sciences, I have heard favourable reports from Chemistry and Sport Science.' SCALE-UP, as an apparently fixed space, accommodates flexibility. David says, as with any learning space, the pedagogy grows:

> *Some people ... feel freer to move about the room, particularly if using the radio microphones. I believe it promotes freedom and flexibility, and I would be happy to teach all my modules in this room.*

He says it is the activities that are critical and advises that short learning activities are best interspersed with class-wide discussion:

> *They have to be pitched at the right level, challenging but achievable. The students need to recognise the benefit of working together or else they just want to do it alone and not share their ideas.*

Every three weeks or so David reassigns the roles of Co-ordinator, Questioner and Scribe to the group members. This keeps them on task and enables them to self-regulate.

'Upside-down pedagogy' refers to flipped learning which requires the student to engage with core content before class. David says students need to be convinced that by 'collecting the wood' beforehand, they can 'ignite' and convert that energy into deeper knowledge by working on the harder concepts together:

> *Students are not used to coming to the class having already done some preparation or background reading. In fact, we are still working on quite how to motivate them to do this, without setting a whole slew of graded quizzes at the start of each session.*

David is clear that technology, like the room itself, has only a supporting role: 'The technology is helpful but not as important as is sometimes made out.' He thinks that new technology is best introduced separately to the SCALE-UP method so as not to confuse the two in the minds of teachers and their students.

More than anything, David says the real value of SCALE-UP comes from its socially interactive methods: 'My relationship with the first years is very good, in no small part because of the open style of SCALE-UP … [the students] really appreciate the direct interaction', he says. He describes how the relationships he has already established with his third year students through teaching in labs, computer classes and tutorials, feed into SCALE-UP: 'In a way, SCALE-UP allows this informality into the theoretical part of the course … the interaction is specific and intense and they appreciate that.'

Making the transition into the SCALE-UP approach may be liberating, but David cautions that it is critical that teachers do not underestimate the time needed in preparation: 'Spend a decent amount of time beforehand coming up with some really great activities. It needs work.' He advises that academics should not expect to get it right first time and need to continually review what works and what doesn't by observing and listening to the students.

13.1 Active classrooms

Box 29. Principles informing the active classroom

Active learning spaces are,

- student-centred – involving the learner working co-operatively (i.e. alongside peers in a supportive relationship) and collaboratively (i.e. with peers addressing assigned problems together) with the facilitation of their teacher;
- responsive flow – closer tutor monitoring of learning, e.g. characterised by integrated feedback.
- authentic and inductive – using real-world situations and methods that provide context, meaning and structure to generative activities and tasks;
- open-ended and structured – involving well-articulated problems that create challenging, creative and rewarding experiences;
- adaptable – the learning community can adapt the learning space over the period of study (e.g. session, semester, year) to support its changing needs;
- connected – supporting the networked learning relationships and knowledge exchange within the space, or external contexts (e.g.

learning networks, work and professional practice, the public sphere), and services aligned to the space;
- functional – incorporating furniture and digital technologies that meet the needs of the learning community, i.e. personal and provided technologies interoperate; chairs and tables are light, robust and reconfigurable; audio visual facilities, network connectivity and storage meet the challenging demands of active user-producers.

Teaching and learning in an active classroom

Reflecting further on the list of principles informing the active classroom (Box 13.1), the idea of active or flexible classroom is best discussed in terms of what the teacher and students do. The teacher performs a facilitative role, working at close quarters with students during the session. The students learn more intensely: expecting to interact, finding no place to hide (Smith Taylor, 2009).

The teacher will make presentational interventions to brief, review and clarify key ideas, re-orientate proceedings, provide generic feedback, make connections between groupwork, summarise progress and outcomes and orchestrate discussions. Being amongst the students, the teacher is likely to refer to students and their work to exemplify learning points.

In an active learning culture, students expect to arrive in class with information, knowledge and ideas in anticipation of new conceptual challenges or ongoing projects. They are clear why this is a good way of learning their subject. Collectively, they will develop their knowledge in a range of appropriate social configurations, working on their own, in small groups of three to five, or in larger configurations including whole-class discussion. The size of groups may vary in session or as the semester progresses in response to the topic and the teaching methods.

The physical space can be adapted by the teacher or the students. Components will include tables and light chairs. Fixed tables, as in SCALE-UP, can have integrated technology (e.g. network ports, screen-sharing, audio and power) and may be associated with specific whiteboards and switchable LED display screens. Table space is used to accommodate note making, drawing on huddle boards, flip charting, use of handouts, and the generation of post-its, in addition to laptop and tablet use.

Where flexible tables are used, they should be robust and easily managed by students for in-session changes. Space within or adjacent to the room is needed where furniture can be stacked. Light but strong and comfortable chairs are needed to enable continuous reorientation so that students can give attention to peers, tutors and screens.

Active classrooms may require an increase to standard student per metre specifications to accommodate teacher movement and unobtrusive group monitoring, as well as student working. Students will move around the space throughout groupwork activities looking over the shoulders of peers to see and give feedback on notes, take part in impromptu conversations with group members or other groups, and work around mobile or wall-mounted group whiteboard space. Whiteboarding requires adjacent floor space to allow for collaborative writing and reviewing, and for classroom viewing and capture. Mobile whiteboards are useful to add space for table-based activities and for making group presentations. Floor space itself can be used for setting up experiments involving people, objects and simulations.

Students may be expected to project examples of their own work onto the relay screens or explain their thinking from whiteboard work. There is no dedicated ‘teaching wall’ in the active classroom. The teacher facilitates activities using mobile or wall-mounted AV controls or unobtrusive rack systems using a wireless mouse and keyboard where possible. Audio and video presentation and recording facilities are integrated throughout the space and digital visualisers, or document readers, work with the ceiling-mounted data projectors or LED screens for presenting pages from books, photographs, small objects and impromptu graphics. The visualisers can also be used to take photographs, to make and record small videos or to produce stop motion animations for illustrating processes.

The room is designed to optimise ambient conditions. Artificial and natural lighting and temperature are highly controllable. Space for coats and bags, storage for specialist equipment, and laptop loan cabinets need to be thought through along with power supplies and access to networks.

Break outs and adjacent space

The concept of the active learning classroom extends into the space adjacent to it. The hub space or gathering space outside classrooms becomes part of the teacher's and students' conception of the active classroom; in this sense, it has a degree of formal purpose.

Adjacent spaces may not be defined as discipline-specific spaces; however, strategic zoning by facilities managers can enhance their use. While adjacent spaces become associated with classrooms, they are usually managed separately as informal space, part of 'a portfolio of discrete, interrelated learning environments, offering spaces with a clear identity and encouraging students to translate their learning preferences into space selection' (Harrop & Turpin, 2013, p. 58).

The formal use of adjacent space can be accommodated using additional seating configured for in-session groupwork. However, timetabling systems are often not configured to co-ordinate the booking of adjacent space. Learning groups can gain privacy and some autonomy by using adjacent space, and the extra room it creates, to establish their team arrangements. Located within range of the classroom, they allow students and teachers to stay connected. The use of glass between formal and adjacent spaces can reinforce this connectivity.

Non-formal use of adjacent space

Beyond scheduled teaching, adjacent space provides non-formal connected space accessible to anyone, being frequented by students, staff and others.

Prior to class, adjacent space acts as a meeting point for friends and peers, allowing them to develop group assignments, charge personal technologies, or borrow laptops from lockers. A range of seating types, such as booths with integrated screens, can accommodate the different needs students have for individual study, conversational groupwork and planning, or simply for individual and social down-time. 'Working alongside' friends and peers is a common mode of study observed by Harrop and Turpin (2013) in which student peers choose to work independently but in proximity to each other. They noticed serendipitous meetings and patterns of groups splitting and re-joining, and some students

purposefully selecting spaces away from friends to avoid being distracted (see Noel Rodgers case study, no. 34). People like to study with people they know or who are working on a similar task. René Meijer (case study no. 6) told me, 'If you look for long enough at individual space you'll see people working on their own task, but actually there are always three or four people close together who know each other. Every so often a head turns, there's a little chat.'

Perching spots, comfortable seating and individual study carrels or group booths allow individuals to access support from tutors or peers in the minutes before or after class. When class is over, the adjacent space promotes study by creating space for clarifying understanding or checking assignment briefs and for making study or social arrangements. A range of informal furniture accommodates the need for 'prospect and refuge', which give outlook and enclosure, a sense of safety and pleasure (Dosen & Ostwald, 2013). In practical terms, 'prospect and refuge' leads to decisions about the use of light and shadow, or the use of solid dividers or glass partitions (see case study no. 6).

Beyond class time, adjacent spaces become hubs supporting placemaking (O'Rourke & Baldwin, 2016). The commuting student and other students with spread timetables can populate and utilise this hub space, which is conducive to either study, social activities or a blurring of both.

The adjacent space, then, connects teaching with independent learning and the development of belonging.

Active learning space engagement

The active learning space prepares students for a world where work is teambased, technology-rich, flexible in nature and globally connected (Valenti, 2015). According to Valenti, 'Today's employers want multidisciplinary workers who are capable of responding creatively to unexpected situations' (*ibid*, p. 35). Valenti describes the need for 'T-Shaped Professionals': individuals capable of using boundary-crossing competencies.

In approaches like SCALE-UP, problem statements provide students with the basis for group activities. This creates structure that guides the learner through a series of steps: problem identification, establishing learning gaps and goals, inquiry design, research discovery, analysis, peer sharing and discussion,

solutions development, synthesis, reflection or refinement, and debriefing or summarisation (Wong, 2003). Such structure fits well in the SCALE-UP space in which a pattern of learning activity keeps students on task, with the tutor acting as facilitator and guide.

Alternatively, Burke (2015) describes how learning scenarios, or hypothetical exercises, can be used in disciplines like Law to involve students in formulating responses by applying what they have already learnt from readings or lectures. She notes high rates of engagement, and Smith Taylor (2009) observes how many other active methods, such as debating, can be used.

Teachers value developing deeper relationships with their students and adopting the facilitation role. They also value the collaborative relationship students have with each other. If properly introduced, students enjoy the teamwork that comes from collaborative projects and say they feel more connected to their tutor and classmates (ALC, 2007). Smith Taylor (2009) reports on several active classroom case studies. Tutors describe students' collaborative engagement as 'thinking together', not just talking, and note that it is necessary to withdraw to avoid distracting the students. They found themselves enjoying sitting with their students, 'clustered around the interactive whiteboard … [becoming] … "part of the table"', being more relaxed and having more fun together (Smith Taylor, 2009, p. 222).

Technology Enabled Active Learning (TEAL) emerged from MIT in 2004, building upon the SCALE-UP model by incorporating audio-visual technology to enhance team collaboration (Dori & Belcher, 2005). It responded to a significant drop in lecture engagement and an increase in failure rates: 'No matter how strongly one feels about the intrinsic worth of the lecture format, it is hard to argue that it is broadly effective when half of the students do not attend the lecture' (TEAL website). The TEAL/Studio course format creates a structure designed to engage students more deeply and recognises how the pedagogic methods they use should reflect professional hands-on practice.

The ongoing development of affordable technologies like LED screens has resulted in a tipping point in active classroom design, making it more likely that SCALE-UP-type facilities will be incorporated into refurbishments. Such spaces

are anticipating greater interoperability between personal and university systems.

Being active and inclusive

It would be wrong to present the active classroom as a panacea for successful teaching. Deciding to adopt active practice is only a start. It is better to understand active classrooms as a resetting of the teacher–student contract, and one that requires a rethinking of roles and methods by all parties (Finelli *et al.*, 2014; Niemi, 2002). Indeed, while the aim is that students will enjoy greater interactivity, they are likely to resist challenging pedagogies which put them on the spot if they have not experienced them before; especially where they are fresh from school systems where strategic cramming for exams is the dominant teaching mode. Care is needed to introduce students and teachers to the active paradigm.

This teaching challenge is accentuated where students with disabilities such as autism are expected to assume active roles. Autism, for example, is marked by differences in the areas of communication, socialisation, and repetitive behaviour (APA, 2000). Carnahan *et al.* (2009) explain that students with disabilities are more successful academically when teachers have high expectations, use evidence-based practices, and design engaging learning experiences appropriately. Teaching is ineffective, however, when it is dependent on the use of verbal language because learners with autism often cannot process complex verbal information. While lectures are not ideal therefore, students with autism also have difficulty in initiating and maintaining attention to activities, and processing information from the environment (Rao & Gagie, 2006).

The teacher must take care to prepare and situate individuals within activities properly and pay attention to how individuals can play to their strengths, whatever their abilities. This is not a matter of an active–passive binary being right or wrong; it is about the general need for the learnercentred teacher to be sensitive to individual students.

13.2 Studio as an active learning space

The studio is understood variously as a material space, a place of teaching and learning, a way of thinking and being, and a place of work. It describes a creative culture in which teachers and students work and study together through practice. It is a mode of teaching characterised by experiential and reflective learning. It is a system of projects and activities, and it is a constructed physical environment (Crowther, 2013; Studio Teaching Project, 2015).

Studio-based disciplines produce creative students who excel in making conceptual connections (Schön, 1984). These interpretive skills can be applied widely, leading to graduates who can see and debate alternative perspectives (Neumann *et al.*, 2002). The studio paradigm demonstrates the qualities of an inductive student-centred learning space that challenges the industrial model of hierarchical teaching: students learn by generalising and co-producing knowledge as an outcome of their immersion in activities.

The studio is neither a formal nor informal space, being an example of an adaptable polycontextual hybrid space. The physical space is versatile and highly functional, convertible for different purposes, physically scalable and able to accommodate individual and collective units.

Throughout its long history, the studio has maintained a strong sense of educational independence and this continues to set it apart from other disciplines. The studio exemplifies authentic, experiential and active learning, with roots reaching back to the masters and apprentices system of nineteenth-century ateliers, from which the Victorian art schools, academies and conservatoires grew. In many cases these became the founding institutions for today's modern universities (Tucker & Reynolds, 2006).

Used by art and design, built environment, and the performing arts, the studio space encapsulates diverse methods and practices. Edwards (2014, p. 121) notes that 'the studio is vital to the culture of these disciplines whether given the name of a performance space, theatre or gallery'. De la Harpe and Peterson (2008) say studios can be expensive to build and maintain, though students in these disciplines are dependent on them to develop their professional dispositions.

Core to these disciplines is a communal learning philosophy (Edwards, 2014) in which students develop, present and defend their emerging practice in the company of peers, tutors and publics; those who come into the space to view degree shows, to experience installations and performances, and to purchase work.

The studio is a place of situated cognition (Lave & Wenger, 1991) that focuses on learning as enculturation into a practice (Brown, 2006). It accommodates legitimate peripheral participation in which the student fully engages in 'real' work using and developing skills, knowledge, methods and attitudes recognisable to real-world practice. Knowledge, sensibilities, beliefs, and the idiosyncrasies of practice and its traditions, are picked up, tried, and altered or discarded. This is a continual balancing act in which an individual's metacognitive knowledge is tested and developed.

The studio, like any classroom, is a paradoxical learning space. Everything about the studio appears to be focused on the student as artisan, creating product for assessment. However, this is deceptive: education in the creative arts is rarely about the product, but its professional methods, protocols and cultures. The studio is a laboratory for the arts in which ideas are turned into serial experiments, or conceptual explorations. These are individually and socially negotiated as a portfolio of problems seeking resolution with the support of the tutor. The studio thrives on opening possibilities, uncertainty, interpretation and originality.

Jamieson *et al.* (2000) describe studio learning space as being continuously used as a facilitated formal and informal setting for student learning. Shreeve *et al.* (2010), in their analysis of the studio as signature pedagogy, identify the following characteristics of studio-based learning:

- learning by doing and acting it out;
- experiential learning;
- uncertainty;
- visible dimension;
- public performance;
- social;
- focus on process; and

- the physical studio space itself.

Crowther (2013) agrees that uncertainty is a valuable quality within studio pedagogy and, as such, the Design studio offers unpredictability and serendipity as the basis for a flexible pedagogy appropriate for the open-ended nature of the design process. Students accept the studio's elusiveness wherein 'solutions' are intentionally incomplete, though necessarily original.

Studio as teaching space

Formal teaching in a studio is often difficult to spot. The academic is a presence in the communal space, constantly making judgements about whether to intervene or to stand back. Their role is to make sure 'you're not smothering the students, you're allowing them to explore, investigate, problem-solve' (Sims & Shreeve, 2012, p. 57). 'Teachers move around and engage in dialogue with the students', with the openness of the studio being part of its signature pedagogy (*ibid*).

Schön (1984, p. 6) discusses how the student must first be motivated and actively engaged in doing something. Secondly, the academic must have strategies for 'demonstrating and imitating, telling and listening' and they must manage these so that they take the form of 'reciprocal reflection-in-action'. He explains that in Architecture, the studio tutor is there to provide instructions on what to do, challenge the student's decisions using probing questions, develop the student's own responses, and find ways to conceptualise what the student is thinking.

In Schön's description of the Architecture studio, the student role is closer to that of apprentice, being directed through projects and tasks and being involved in grasping the meaning of what the 'master' has said. Teaching here is more structured than in some other studio-based disciplines where the student is involved in explorations composed of a multitude of personal experiments that test their understanding and which allow them to translate techniques into a repertoire. By continually addressing these problems, the student develops their knowledge, skills and sense of becoming.

The art studio as learning space

Within the larger core space of the art studio, students establish themselves and their work in temporary personal spaces which are constantly accessible to them. They work alongside their peers, who may sometimes be collaborators but who are, nevertheless, available to each other. While students are typically assigned individual spaces, a more collective approach is emerging, reflecting real-world practice and the cost of studio space (Newth, 2016; Davidts & Paice, 2009).

To an Art student, the studio is their home base; somewhere of their own to go each day. It is an open social space in which they are surrounded by their work and materials: preparatory sketches and sketchbooks, inspirational objects, portfolios of previous pieces, work in progress on the walls, paints, inks and jars of oils, resins and turps, as well as rags and other essential paraphernalia. There is a physicality within their studio space; a continual dance involving movement around one's work, the ritual of cleaning up as part of a reflective process, of viewing and reviewing the work of others, of having a wander and a stretch, and of moving between technical processes and creative thinking.

In some studio disciplines, classes meet during the week for sessions lasting several hours. Beyond these more formal interventions, students are encouraged to work in the studio. They respond to briefings or negotiate proposals and, from this, they explore their ideas in depth. Here, they define 'experiments' which can be understood as personal or group tasks to test and stretch their thinking.

Using analogue or digital formats, students learn by creating sketchbooks, portfolios, installations, prints, manuscripts, two and three-dimensional works in multiple media, performances, or time-based media. Each piece feeds forward to the next. The studio, therefore, epitomises an authentic and troublesome learning environment. It offers a developmental and reflective learning experience in which students work iteratively, presenting their work for studio 'crits' at appropriate intervals. 'Crits' are review activities that blend learning in

terms of presentation, explanation, defence and assessment, all generating feedback from tutors and peers to support the progression of their work.

Assessment, as in any discipline, is also paradoxical because it seems to emphasise learning as product (Newth, 2016). In art and design, summative assessment happens through degree shows, portfolio submissions, sketchbooks and journals, presentations and performances. Each method implicitly challenges the learner to refine their thinking and, in so doing, opens the learner to further possibilities that prove the primacy of the learning process, not the product (Newth, 2016; Orr, 2010).

Qualities of a student learning space

Formality

Formality Little *et al.* (2009, p. 38), in a review of Art, Design and Performing Arts education, highlight the informal culture evident in studios where there is 'a greater sense of community and partnership between staff and students.' Many commentators describe this quality as being neither recognisably formal nor informal, but being designed to accommodate unknown creative outcomes (Sims & Shreeve, 2012; Austerlitz *et al.*, 2008; Schön, 1984). This collective ethos is not necessarily always present, with Fine Art tending to value individualism (Newth, 2016). Informality is recognisable as self-direction, open-ended and playful possibility thinking, persistent, thorough and deep exploration, creativity over expedience, the value of failure as opportunity, and a readiness to seek responses to emerging or ill-formed ideas.

Liminality

Williams (2014) challenges the dependency of the studio-based learner on the tutor-as-mentor role in design disciplines (Schön, 1983). Instead, he argues that the studio is best understood as an active liminal space; a more challenging and supportive studio environment that focuses on getting to grips with threshold concepts and troublesome knowledge (Meyer *et al.*, 2010).

The digitally connected studio

Digital creation tools have been part of practice since the 1990s in studio-based disciplines with the incorporation of Mac suites, the use of video in Art and Performance, and the development of audio synthesis and midi programming in

Music, for example. The adoption of institutional VLEs, however, is not as evident as in other disciplines where there is less of a sense of collective space or co-location. The value of connectivity within the professional studio, as well as in the public art and design context, has become more of a driver for these disciplines where the affordances of the digital learning space are being considered.

McDonald and Glover, for example, have explored how a rich augmented space can be created using pervasive beacon technology as discussed in their case study (no. 23).

Williams (2014) describes how a blended approach using concept videos distributed through the VLE can support practice; however, he cautions that readymade online tutorials provide a disjointed response because they do not connect the student with their tutors. Blended learning spaces, he argues, can create further opportunities for building trust through the co-production of community resources that explain troublesome concepts..

Return to the atelier

Within the learning studio, students and staff build relationships, develop a shared repertoire of resources for problem solving, and establish a common vocabulary. Experts from professional practice are frequently invited to take part, modelling their practice and discussing their work. Brandt *et al.* (2013) observe that as students encounter more complex design problems 'a palpable shift' occurs with students identifying as 'designers' and viewing their peers as 'invaluable resources for improving their designs', thereby learning the essential professional skills and habits together through their direct interaction (*ibid*, p. 336). They propose that the studio as an academic space and as a space of professional practice can be reconceptualised by establishing 'practice communities'; in essence reconstituting an in situ master–apprentice ethos that prepares students as 'becoming professionals' through their adoption of professional tools, practices, and beliefs. The co-location of professionals within the studio, they suggest, allows students to become members of the practice community, to position themselves and develop an understanding of disciplinary norms through legitimate peripheral participation.

Studio for all?

Underpinning the work of Brandt *et al.* (2013) is Schön's (1985, 1987) proposition that studio-based learning can serve as a way for all students to learn to participate in the cultural practices of their discipline. Developing such graduate capabilities and dispositions is a priority for all students (Barrie, 2006).

Within the learning spaces literature, exploration and experimentation in active learning spaces is a constant theme, described by Jackson *et al.* (2016b) as 'space for exploring, inquiring and adventuring … [in which] we have to deal with uncertainty, ambiguity and perplexity'.

The InQbate study concluded that the studio environment offered the most flexible and supportive learning environment within which creativity could flourish regardless of the discipline. The studio is an immersive networked place of individual effort and collective agency; a place of co-operation and co-production; and a cauldron of ideas, technologies and people. The time is right to explore how the studio learning space might be used to good effect across disciplinary curriculum experiences (Middleton, 2017).

13.3 Labs and superlabs

In the sciences, exploration and experimentation comes from a more controlled, but nevertheless active, experience using laboratories.

Some universities are investing in new high-quality and high-capacity 'superlabs' to meet the needs of multiple disciplines at scale. These industrial-scale leading edge facilities, often developed with the support of industrial partners, can accommodate hundreds of students, preparing them for careers at the leading edge of their disciplines. To enhance graduate employability, state-of-the-art laboratories are needed to support the specific requirements of disciplines including Chemistry, Forensics, Physics, Electronics, Optics, Radiation, Mechanical and Civic Engineering, Geology, Geophysics and Environmental Sciences.

Power, data, wifi connections, audio-visual consoles and wall-mounted repeater screens distinguish today's labs from pre-digital spaces, while students are more likely to use their own devices for making records (see the David

Smith case study, no. 3), although such use can compromise experiments in disciplines where managing contamination is critical (Cropper *et al.*, 2016).

The Central Teaching Laboratories (CTLs) at the University of Liverpool opened in 2012 as a shared teaching laboratory for physical, environmental and archaeological sciences incorporating Oceanography, Ecology, Chemistry, Physics, Archaeology, Geography and Geology. The CTL complex has been designed to meet specific needs within a shared space and Dr Cate Cropper and colleagues have developed a brokerage model to manage its effective use. The model overcomes previous barriers to sharing space and equipment resulting from historic operational constraints, and their Education Broker team is now able to promote new and improved pedagogies, common project opportunities, and support for the development of crossdisciplinary student skills and employability (Cropper, 2017). The team is a co-located satellite group of academics able to orchestrate collaboration across disciplines and develop innovations such as new experiments, interdisciplinary projects and co-curricular events.

The CTL complex incorporates specific labs such as a High Service Laboratory designed for synthetic chemistry and a General Chemistry Laboratory with integrated computing connected to microscopes enabling student groups to view samples together. More space, plenty of PCs and a flexible approach to managing their new equipment has resulted in increased occupancy of the labs. The investment brings the benefits of a modern and accessible environment with specialised equipment for existing disciplines, and it gives students access to industry standard equipment and practices.

While some students initially reported the loss of a sense of home (Cropper, 2017), disciplines have reported many beneficial impacts from the ‘whole space’ philosophy and its brokerage. These include changes in assessment in Geography and opportunities to develop students’ problemsolving and mathematical skills in Physics. Interdisciplinary projects have been initiated, for example between Chemistry and Engineering, where students have investigated the fat/mineral content of food cooked with different appliances.

13.4 Makerspaces

Makerspaces are physical spaces in which 'people gather to share resources and knowledge, work on projects, network, and build' (ELI, 2013). Sometimes known as hackerspaces, innovation centres, or Fab Labs (Carlson, 2015), makerspaces appear to be a cross between studio and lab spaces in the ways participants work with materials and machines to design and 'make', either independently or collaboratively (Halverson & Sheridan, 2014). 'MakerEd' involves students using tools such as 3D printing, injection moulding, robotics, microprocessors, wearable computing, e-textiles, printmaking, and working with 'smart' materials. MakerEd can also involve the use of programming languages in the creation of physical artefacts and apps. In these spaces, students brainstorm, invent, design, build, test, fix and improve their work.

The use of higher education makerspaces supports students to develop personal attributes through multidisciplinary exchange. Carlson (2015) notes that, while running makerspaces can be expensive, many colleges and universities are now developing this multidisciplinary creative melting pot approach, usually outside of formal teaching. Engineers, artists, musicians, ecologists, anthropologists, lawyers, and business and medical students find themselves co-located in the makerspace, potentially benefiting from their exchange of ideas. He observes that makerspaces teach undergraduates how to be self-starters; not only to foster entrepreneurialism, but to forge relationships with employers.

The formal relationship between the teacher and student is often different in makerspaces to other learning spaces (Sheridan *et al*., 2014) with the co-location of peers and tutors being like relationships in studio learning environments (Sheridan *et al*., 2015). Individuals and small groups are frequently self-reliant, regularly demonstrating techniques or learning by observing each other. Just-in-time training, designing, and making blur as experts within the maker community share accounts of false paths or unproductive approaches with less experienced members (Sheridan *et al.*, 2014).

Feltham and Keep (2015) say students in MakerEd learn through 'failing up': fixing mistakes, testing and improving their constructions. The maker opportunity challenges the learner to develop their design thinking, problem-solving and creative skills.

The active, playful informality of connected learning in makerspaces and studio-based situations (Ito *et al.*, 2013) finds links with innovative pedagogies such as Lego Serious Play (LSP) in which, 'the physical building process [is used] to unblock habitual thinking patterns that prevent solutions from emerging … [and to construct] … metaphorical and symbolic creations that represent problems, solutions, realizations, and models of communication' (James & Brookfield, 2014, p. 116). LSP is structured around the setting of a challenge, the building of a model, sharing and giving meaning, concluding with questioning and reflection.

13.5 Incubators

Academic incubators exist to spark strategic partnerships between academia and industry and connect students to start-ups, investors and institutions they might not otherwise encounter. As with makerspaces, incubators create a space in which students can develop core skills such as negotiating, bargaining, collaborating and consensus building (Delphenich & Broz, 2015).

University incubators are likely to take the form of business facilities with project rooms being facilitated around semi-structured collaborative projects. Like Brandt *et al.*'s studio bridge concept, they allow students to transition out of university by 'jump starting' business ideas in a supportive environment.

Incubator spaces are a hybrid of professional workplaces and supported learning space, and as such can inspire students to adopt professional behaviours, and to collaborate and share practice. They are equipped as innovative professional facilities designed to support individuals and project teams with high speed networks, video-based collaboration, high-resolution visualisation, and 3D printing (Delphenich & Broz, 2015).

13.6 The professional learning studio

Valenti (2015) develops the idea of 'studio for all' and professional incubation describing active learning spaces as being designed for team-based co-

operation. He suggests this will involve more multidisciplinary group working. He also predicts greater incorporation of placements, internships and other forms of engagement with real-world employers, clients, service users and publics. This idea of studio learning space will incorporate pervasive technologies that support the production of multiple forms of rich media as an integral part of the studio working environment. Alongside active spaces, students will work on task, but out of sight, regrouping around the periphery of the active studio environment for team meetings, brainstorming, prototyping and making activities.

Valenti highlights Project Kaleidoscope (https://www.aacu.org/pkal), which exemplifies the learning studio concept in US STEM programmes. It reconceptualises the studio-based active classroom as authentic and supported workshop learning (rather than training).

13.7 Hybrid learning studio

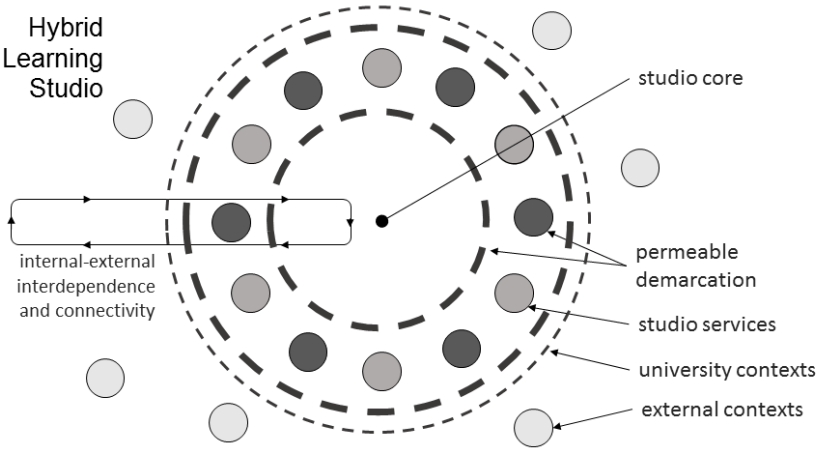


figure 13.1 The Hybrid Learning Studio - a concept of studio space for all

The hybrid learning studio (Fig. 13.1) encapsulates many of the principles discussed in this chapter and conceptually proposes an ideal studio learning space for all. The hybrid learning studio imagines a model to support student-centred active learning by accommodating multidisciplinary projects as the basis for problem-based learning within a formal–non-formal networked learning philosophy.

The studio core is perceived as a home base for individuals and teams and represents the central experience of student learning. Students identify with their study space as they work co-operatively amongst their peers. Students use the space for formal and non-formal purposes, receiving visits from tutors, MKOs, and peers. ‘Crits’ or review conversations are carried out in small or large, formal and informal groupings.

Students undertake negotiated work informed by their interests, previous challenges and ongoing review of and reflection on their knowledge and capabilities. The environment is geared to promote intrinsic motivation by involving students in the production of individual pieces of work and team-based projects. Peers have varying levels of experience which they apply to resolve problems collaboratively.

The core space is physically adaptable so that individual or group stations can be moved away to expose floor space for performance, presentation and other planned or impromptu events.

The studio core is surrounded by studio services. They include facilities that are ancillary to the core learning experience, such as resource centres to support inquiry, makerspace workshop facilities, stores, incubator spaces, tutorial support, ‘stand up’ meeting rooms and brainstorming space, wellbeing support, cafés, hover spaces, etc. The idea of satellite services is an example of a ‘just-in-time‘ design rationale based upon Weinberger’s concept (2002) of small pieces loosely joined. The principle of permeable demarcation incorporates the value of connectivity within, across and beyond the hybrid learning space epistemologically, socially and digitally.

The university context is also defined as a permeable identity zone, providing a focus for those working within the context (e.g. students, learning and research teams, tutors, technicians and support staff) and for those working outside of the university forming external contexts (employers, professionals, clients, publics, connected alumni, and students in the field, on placement and internships).

Participants in the hybrid learning studio are purposeful, servicing the world beyond the university through work-related learning projects, research,

knowledge transfer and work-based learning. The external context provides problems, briefs, examples, professionalism, discourse, audience and validation. In turn, the space affords incubation, networking, CPD, internship, placement capacity and access to research and innovation. The relationship between the internal and the external is continuous, being enhanced and maintained through its augmented digital layer and collective reputation.

While this model of the hybrid learning studio is theoretical, it incorporates practices discussed throughout this chapter and evokes a concept of hybridity that seeks to find meaning and energy by questioning the tradition of enclosing learning and by incorporating boundary possibilities.

The final chapter summarises the key themes that have emerged in the book. It generalises the specific conceptual model of the hybrid learning studio to establish a proposition for hybrid learning space, noting the interrelation of space and learning.

Questions for reflection and discussion

1. Active learning is often set in opposition to the lecture. The idea of the flipped classroom has emerged in recent years, identifying how lectures are situated in relation to student activities. What is the role of the lecture in your practice and in what ways can you develop it to situate it in a learning paradigm?
2. The idea of ‘studio for all’ proposes a holistic view of hybrid learning space that is student-centred, active and reflexive, and that broaches traditional barriers. Can you map these ideas to the experience your students have now? How can you project these ideas to the design of future spaces and experience? Who can you work with to plot this change?

Future learning spaces: context and connections [C7]

Cover sheet and chapter abstract

Citation:
Middleton, A. (2018). Future learning spaces: context and connections. In A. Middleton, Reimagining spaces for learning in higher education. (pp. 194 - 200). Basingstoke, Hampshire: Palgrave Macmillan. ISBN: 978-1-137-56426-9

This concluding chapter from *Reimaging Spaces for Learning in Higher Education* draws upon all of the book's case studies to present the concept of hybrid learning space. Together, the chapters reflect the hybridity of the learning experience as being multi-layered, agentic, ecological, co-operative, networked, generative, loosely structured or non-formal, technologically situated, and authentic.

Learning space is a site of contestation being confused by the different contexts it services: organisational, pedagogical and ontological. Educationally, an ontological perspective helps us consider the learning environment as one which is navigated and negotiated by the agentic learner. Superficial, yet rigid, demarcations are disrupted by looking at the student experience of learning in a hybrid paradigm. The use of personalised technologies and media demonstrate how space is traversed; boundless and often polycontextual in nature. Spatial considerations centre on the individual's non-formal learning experience and highlight the need for a learner to be critically aware of spatial affordances, becoming spatially fluent.

Spatial fluency recognises key emerging themes from the case studies: spaces for learning are essentially experienced personally, although socially situated. Learning involves generative acts which are situated in a dynamic context. Connectivity recurs in ideas of ontological, semantic and digital networks and reflects the ecological nature of a person's education, the complexity of evolving knowledge, and how it is interrogated.

Experiential learning is rich and involves the agentic learner as researcher, curator, producer, and publisher. Education, and the environment it uses, is often expressed in simple binary ways. This is misleading, however. Knowledge is complex, continually generated and interpreted, and learning in higher education should reflect this spatially. Megele's ENABLE framework (2014a/b; 2015) encapsulates this through six pedagogical ideas: learning is enquiry-based, networked, active, blended, leaderful, and ecological. The concept of hybrid learning studio embodies these principles.

[292]

This concluding chapter consolidates the conception of a future hybrid learning space. It begins by summarising the book's discussion and key themes. The ENABLE pedagogic framework (Megele, 2014a, 2014b, 2015) is reviewed as an exemplar of a progressive hybrid learning philosophy; an understanding that can inform all we do in the future learning paradigm. The requirement to embrace uncertainty and risk in the development of innovative practice is elicited through a final review of the book's case studies. The chapter concludes with some final suggestions for approaching the reconfiguration of learning space.

14.1 A summary of themes informing the design of future learning spaces

In the introductory chapter, I proposed that a series of positive, disruptive influences have been converging to collectively challenge longstanding conceptions of learning space. These have been explored throughout the book, and powerful connections have been found between the disruptive effects of digital and social media, the ubiquity and pervasive connectivity of personal smart devices, explorations of the principles of openness and learning networks, and the use of rich media to heighten the authenticity of the learning space.

In the corporeal space, assumptions and preconceptions about the efficacy of rigidly demarcated learning space have been challenged. Examination of the development, management and evaluation of the physical space and its services indicates a disjuncture between institutional operations and progressive student-centred pedagogies. Given the close relationship of space to practice, and its determining influence, the concepts of built pedagogy and learning paradigm need to be fully appreciated by all who have a role in developing learning spaces in higher education. Further, learning space needs to be understood holistically and simple distinctions between formal and informal space need to be challenged. Students and staff live through space, and their presence and sense of belonging is critical to achieving personal and course identity, and successful outcomes.

The digital dimensions of the learning space, controlled by the individual as much as by the institutional provider, extend the corporeal space through its

boundless networks connecting academic experiences to lifewide and lifelong learning contexts.

Discussion of these themes has taken place within the context of the sector's capacity for supporting academic innovation, the need for academic and critical digital literacies and the development of graduate capabilities. At each stage, discussion has turned to the rich possibilities of an active learning paradigm fit for our times. This consideration of new spaces for new ideas about learning in higher education has resulted in the identification of some important key themes.

Personal space

A personal learning space reflects the aspirations of the learner as they form new identities. Effective spaces are experienced holistically and contiguously. Though personal, they are socially situated, inherently authentic, navigable and ultimately self-determined.

Generative space

A generative learning space is experienced as being creative and productive. The learner is curious, motivated, active and challenged. The generative space reflects a co-operative philosophy that accommodates the purposeful activity and attitudes found in real-world situations. As such, the learner has access to expert performances, adopts multiple roles and perspectives, practises by articulating what they know, and reflects on and evaluates their practice (Herrington *et al.*, 2014). The generative space challenges the learner to be intellectually enterprising in demonstrating their understanding and capabilities by being professional, playful and resourceful.

Dynamic space

In a dynamic space the learning context is experienced as being subjective and continuously changing. The experience is rich because its context is uncertain, incomplete, changeable and unique. It directly reflects the learner's own growing knowledge and experience, that of others, and the deeper, more sophisticated and nuanced demands of the curriculum and of lifelong aspirations. It is challenging, compelling and vibrant.

Connective space

Learning and knowledge is experienced as being networked. Learning is richest when it stretches the learner and is liminal in nature. It involves making connections across conceptual and metacognitive thresholds.

Connected learning is inherently open-ended and therefore vibrant. It is full of possibilities for communal engagement, mutual benefit and joint enterprise.

In the connective space, there is a sense that one thing can lead to another and that, ultimately, the individual is self-determined and must take control. A connective learning space is recognisable by its permeability and liquidity as the learner redefines problems with their network. Participation in learning networks is characterised by experience, autonomy, nomadic thought, networked authorship and agility.

Rich space

Learning is engaging when it is rich, affording many possibilities. Learning is experienced in multiple dimensions, using multiple media. The learner is researcher, curator, producer, and publisher, and each role demands that the learner reflects carefully on what they know. Rich learning is usually socially situated, provocative, discursive, active and vibrant. It displays the characteristics of authentic learning, having a heightened sense of context.

Hybrid space

Learning experience, more than the built and digital space, has been central to the book's focus. This experiential view of learning space has revealed hybrid conceptions of learning. Binary conceptualisations of learning space are unhelpful because they incline us to believe learning is something that can be hermetically sealed and delivered one way or the other. Hybrid learning design challenges the acceptance of binary positions and argues for a holistic view of space in which there are structures and demarcations, but ones that are permeable and designed to accommodate and promote boundary crossing.

14.2 The ENABLE Framework

It is useful to consider these themes in the context of Megele's ENABLE Framework (2014a, 2014b, 2015), which embodies these principles and makes them pedagogically coherent.

Megele has been researching Twitter's impact on identity, relationships, and empathy. Her ENABLE model is an expression of a digital-social learning paradigm and a co-operative inquiry model (Heron, 1996) in which student groups experience peer learning as co-subjects using an MKO relationship (Vygotsky, 1978).

Megele developed and applied the ENABLE model to the redesign of an MSc module in Social Work, Social Care and Media. Her aim was to enhance her students' engagement and to leverage their use of social media so that the connections across the different dimensions of their learning became clear to them. In contrast to teacher-centred models, she describes a paradigm shift in which knowledge is primarily understood as being internal to the learner. She argues that having a meta view of the learning space is not only essential for effective student learning, it is central to developing their appreciation of lifelong 'e-professionalism'.

The ENABLE framework is organised around the following six ideas set out by Megele and paraphrased here.

- **Enquiry-based learning (EBL)** - EBL accommodates interest-driven engagement and challenges the learner to find their own way into their topic. The act of enquiry, not just its focus, is a means of self-directed study designed to develop the learner's knowledge and capabilities. The enquiry task scaffolds the development of the student's interest in the topic, making their learning relevant to their own goals, values, existing knowledge and experience. This develops students' confidence and professionalism.
- **Networked learning** - While the learner's autonomy is valued, ENABLE notes the importance of learning that takes place through connection and interaction with 'others'. Peers, practitioners, clients, experts, organisations and publics enrich, inform, and are beneficiaries of learning. Connecting to the experience and thinking of others is possible through a range of digital and social media as well as corporeal situations. Megele refers to the use of Personal Learning Networks (PLNs) and other peer learning models and the underpinning theories of

knowledge networks, Communities of Practice (Lave & Wenger, 1991; Wenger *et al.*, 2002b) and Communities of Interest (Garrison *et al.*, 2000). Being aware of distinctions between community and network forming is useful for the academic. The former draws on mutually beneficial association, while the latter involves individuals in making and managing connections or ties. They are not exclusive; however, the nature of identities and engagement protocols can be emphasised differently.

- **Active learning** – It is already clear that ENABLE does not advocate a passive or dependency-based learning strategy. It incorporates experiential learning (Kolb, 1984), active and deep learning by doing (Bonwell & Eison, 1991), and developing learners' meta-capabilities (Krathwohl *et al.*, 1973). Many specific pedagogies are used to engage students in active approaches.
- **Blended learning -** At its simplest, blended learning (Garrison *et al.*, 2008) is used to mean learning in and across physical and online spaces. A more sophisticated view is one that approximates to connectivist hybrid learning, being multidimensional and adaptable by the learner. In the context of Megele's framework, it suggests that the teacher has more liquid understandings of spaces used in the course of learning.
- **Leaderful learning** - Megele (2014a) says that leaderful learning is characterised by 'the absence of "the leader" and the abundance of leadership' and that learning can be understood as a co-constructive act being 'about co-production rather than competition'. It is what Matt Johnston refers to as networked authorship and is the difference between authoritarian teaching and authority (Neary, 2015b).
- **Educational ecology** - ENABLE incorporates the idea of learning ecology which emphasises the need for clarity about an individual's learning goals, and the link between activities and learning process in a context of continuous improvement.

14.3 Room for risk

The uncertainty of knowledge means that learning in higher education involves risk. Learning space, in its literal and metaphorical meanings, is often a matter of choosing what must be presented as certain, and what must be understood as dynamic and adaptable. In different ways, this is evident in this book's case studies.

- Using a given structure, Gary Wood's students (case study no. 20) were required to co-construct a repository on linguistics by entering into unpredictable co-operative learning relationships;
- Jill LeBihan and Toby Carter's respective students (case studies no. 10 and 13) used novel social media tools to craft their assignment stories in new ways;
- Noel Rodgers (case study no. 2) sustained his engagement as a mature student by relying upon the constancy of his course along with his readiness to try new experiences to achieve his aspirations;
- David Smith recognised the value of student placemaking and agency within the formal space of the lab (case study no. 3);
- David Eddy conceived of a novel, generative and communal MOOC space to maintain his social constructivist and connectivist learning philosophy by using a provided online space integrated with social media tools (case study no. 8);
- Matt Johnston conceived of his Box of Books as a tangible networked learning space capable of mediating networked authorship amongst groups of dispersed learners (case study no. 17);
- Sarah Smith and her peers constructed a revision group space using social media and found themselves connecting with a potentially vast network of peers and professionals (case study no. 15);
- Ollie Jones imagined and constructed a high-quality encyclopaedia for globally dispersed medical students and discovered his leadership qualities and tenacity by doing this (case study no. 21);
- Communities, like Pol Nugent's Philosophy in Pubs group (case study no. 12) and Sue Beckingham's tweetchat group (case study no. 14), find spaces in which to congregate for co-operative, trustful and mutually rewarding learning;
- Academic innovators and determined mavericks like Anne Nortcliffe (case study no. 9) and Shaun Hides (case study no. 11) continue to take risks to do the right thing for their students and their practice, even if that means they fall out of step with convention;
- Beryl Jones (case study no. 22) was committed to experimenting with the unknown to discover how new levels of connectivity enhance classroom engagement;

- Ian Glover and Kieran McDonald carried out a speculative investigation into how beacon devices may add an augmented connective layer to enhance the qualities of the studio space (case study no. 23);
- In Natalie Wilmot and Diane Rushton's case study (no. 19) global learning relationships were forged that connect different contexts;
- Moving from a pedagogy based on large-scale lectures to the use of large-scale active learning classrooms is exemplified by David Fairhurst in his use of SCALE-UP (case study no. 24);
- The fieldwork undertaken by Derek France's students experienced within a Third Space bonding context stands out (case study no. 18);
- René Meijer's case study (no. 6) exemplifies experience of developing innovative infrastructure;
- The adoption of unconventional social media spaces as in-between learning space was exemplified in the cases of Julie Gillin and David Clarke (case study no. 4), Charlotte Burton (case study no. 16), and Sarah Honeychurch and Shazia Ahmed (case study no. 5);
- Viv Rolfe's case study (no. 7) demonstrated creative exploration of the open non-linear space, where there are endless possibilities for creating different and rewarding learning responses and new learning habits.

14.4 Leading spaces

My own experience of leading innovation in the thinking of learning space design was the trigger for writing this book. I had a moment of clarity in which I understood something I realised was important: in higher education, learning and space are interrelated but complex. From this, it becomes critical that wise decisions about learning space are made because a learning paradigm cannot thrive in an estate constructed for instruction.

Further, as I said in chapter 1, 'Space to think', 'a transformative discourse is dependent upon connecting and challenging the interests of diverse stakeholders. Learning space development either connects understandings or falls between them.'

This book has been a quest to understand the many dimensions of learning spaces in and beyond higher education: spaces which require an 'abundance of leadership' to create them so that they are spaces fit for learning today and the future.

Questions for reflection and discussion

1. Thinking about your own vision for future learning spaces, list the key challenges that you, your peers or managers need to tackle.
2. Establish a group of innovators made up of a broad mix of people. Together, explore your ideal future learning space. Begin by collectively creating a detailed drawing of your imagined space on a large whiteboard. Annotate it and then record a video with a collective commentary that will engage others. Post it to the Web using the hashtag #RS4L.

Studio for all: perspectives on the pedagogy and ecology of studio-based learning [A4]

Cover sheet and article abstract

Citation: Middleton, A. (2017). Studio for all: perspectives on the pedagogy and ecology of studio-based learning. Creative Academic Magazine, 'Exploring Creative Pedagogies for Creative Learning Ecologies', 7D July-October 2017, 31-38. Online at:
http://www.creativeacademic.uk/uploads/1/3/5/4/13542890/cam7d.pdf

The paper reports on responses from educators in diverse studio-based disciplines to the question, “What does studio mean to you?” It explores whether there are common ideas about studio which can be shared more widely for the benefit of any discipline. Educators reveal meanings which indicate studio is both versatile and anomalous.

Studio operates in many ways and on many levels, often at the same time. It is a material space, a place of teaching and learning, a way of thinking and being, a place of work and home, and a networked environment ontologically and technically.

Studio-based pedagogies disrupt notions of enclosure and formality while, at the same time, defend cultural traditions and identities. They embrace interpretation, uncertainty, and serendipity, and reify challenging and creative experiences that result in learning characterised as reflection in action. Respondents observe the value of learning through failure iteratively, making the studio, paradoxically, a meeting place of experimentation and exploration.

The studio is essentially co-operative and, without any contradiction, is both individualistic and collective in nature: a place of risk, trust and support.

Studio is the quintessential assemblage of the physical and technological space, its people and their individual and collective ambition, and the problems and opportunities that are found, made and resolved. It is a volatile space in which each learner must assume their agency as an autonomous networked co-operator.

The article defines studio, educationally, as being a space in which craft, knowledge and dispositions are valued. Spatially and culturally, it affords creative thinking and originality, being an immersive networked place of individual effort and collective agency. It is a place of co-operation and co-production; a cauldron of ideas, technologies and people.

In all senses, the studio is full of possibilities, being a fluid, unbounded locus of placemaking.

"There is knowledge, or better yet knowing, in practice. People have in their doing a tacit kind of knowing. They know more than they can say, and in zones of uniqueness, uncertainty, and conflict they are sometimes able to reflect on what they know"1:3

Introduction

Several contributions to the Creative Academic inquiry into creative pedagogies for creative learning ecologies have drawn attention to the importance of certain sorts of spaces in encouraging learners to use their creativity [2,3]. In this article, I build upon Donald Schön's observation, above, of the studio as a place of tacit learning and his assertion that the studio is an ideal space for developing conceptual knowledge[1]. I set out to discover what we mean when we talk about the studio as learning space and a place of practice. To do this, I have consulted with people who have taught and learnt in studios and asked them, "What does studio mean to you?" and used their testimony alongside the literature on studio learning to discover whether there is something we can call the essential studio. A number of these testimonies can be found on the #creativeHE *Google +* forum for conversations about creativity in education.[4] A goal of my study has been to explore the degree of commonality about the studio within those disciplines, to distil its essence, and to ask if this can be shared more widely for the benefit of all.

The general educational value of the idea of studio is illustrated in a comment by Fred Garnett, an advisor for *InQbate*, the Creativity CETL at Sussex University. "After a long consultation and design process they built an interactive classroom that was based on the Art School learning model." *InQbate* concluded that the studio environment offered the most flexible and supportive learning environment within which creativity could flourish regardless of the discipline.

In formal educational environments the studio is perceived differently to other types of learning space like the lecture theatre or the classroom. Creatives from many disciplines say that their studio space operates on many levels, serving as a private, social and professional space for their work and study. They are clear that the studio is imbued with meaning, being understood variously as a

material space, a place of teaching and learning, a way of thinking and being, and a place of work.[5] For some, their very identity is bound to the idea of the studio. Here, I will make connections between conceptions of studio and the way it is lived as a networked and ecological environment, and how this reflects an emerging idea of digital hybrid learning studio.

Studio learning space

Etymologically, studio is derived from the Latin *studere* to study and historically its identity is as a place of learning and apprenticeship. However, its trajectory as a learning space is distinct from that of the dominant, pedagogic and cultural trajectory of the didact.[6] Pedagogically, the studio is a space for practice founded on exploration, interpretation, uncertainty, serendipity, experience and, importantly to Schön, reflection-in-action.[3] Shreeve and Batchelor[7] say that for tutors the studio "is not didactic, but open-ended, individually focused and about realising the potential of each student". Not all studio disciplines agree with this Fine Art view of developing individuality, however. In Design or Performance, for example, the studio is as often about being group-centred. In all cases, studio philosophy tends to be about exploration and experimentation where ideas, topics or themes are explored. In the drama studio Paul Kleiman explains the studio creates a space for exploring themes through experimentation with a 'Let's try' attitude.

There is also consensus that the studio, whatever it is, contrasts with the didactic philosophy of the lecture room in which the single authoritative voice of the teacher is used to systematically deliver highly structured knowledge. Paul Kleiman, who has experience of both art and theatre studios, reflects on how the studio is essentially "a democratic, shared space, in complete contrast to the somewhat 'authoritarian' space of the lecture theatre and the standard classroom." Perhaps there is a contrast between closing down or managing knowledge and the studio philosophy of resisting the resolution of knowledge; keeping possibilities open for as long as possible.

The traditions of the ateliers, conservatoires, schools of architecture, and the performing arts have had, and maintain, distinct identities. In the UK, colleges of the arts, technology and education were largely subsumed by degree-awarding

universities, being integrated as departments through changes following the Robbins Report[8] in 1963. This shift addressed the need for higher education to have a better approach to financial management, recognise the advanced levels of educational quality in colleges, remain competitive on a global stage, and meet a demand for growth. Despite this organisational convergence, institutional provision has remained mixed in the plastic[1] and performing arts while cultural identities have been keenly protected. This determined independence may explain why the essential studio is not well-understood beyond its disciplines.

Studio as an engaged learning experience

While acknowledging a diversity of practices across the studio disciplines, artists and performers tend to be independently minded and, without contradiction, critically co-operative. In educational development, where my own interest is located, a desire to move academic practice from a teacher-centred paradigm towards student-centred active learning has been ongoing since John Dewey first promoted ideas about experiential learning[10], and latterly through a more widespread appreciation of student-centred active pedagogies and the conception of the learning paradigm.[11] This view seeks to create an environment in which deep level learning happens, where learners attempt to connect ideas as they understand underpinning theory and concepts, and make meaning from material under consideration.[12]

The massification of higher education and the emergence of digital technologies since the 1990s have affected the learning environment for all disciplines, inherently challenging the teacher to consider their students differently. A marked growth in student numbers, and greater diversity, mean that the teacher must think about learner engagement as a prerequisite to student learning; it is not enough to assume that students are intrinsically motivated and academically capable. Equally, it is not enough to understand

[1] Plastic Arts (spatial arts) a concept uniting forms of art that exist in space, do not change and develop over time and are perceived visually e.g. painting, sculpture, graphics, photography, architecture and artistic

learner engagement as meaning keeping students ‘enjoyably busy’. [13] Teachers in all disciplines need to be artful about how they inspire purposeful activity, not least because in the UK they cannot hide from the National Student Survey or the Teaching Excellence Framework. Consequently, classroom design and practice is turning to ideas that resemble some of the characteristics of studio-based learning.

> *"The spaces that are most effective for active and collaborative learning are those that create a flexible and fluid environment. A studio model, which resembles an open workspace for architects or artists... This enables more interaction than the typical classroom and supports student engagement and movement."*[14]

The second factor, the advent of digital technology, largely remains full of potential as a learning space. Institutionally provided and personal technologies are ubiquitous in universities and have changed how we operate but, arguably, decades of investment have been misguided by the idea that learning is about the systematic and expedient delivery of knowledge. Consequently, there has been little real progress when it comes to the digital affecting the nature of learning. Learning today looks very much like learning yesterday.

Recently, however, the use of social media has shown us how co-operative networks can foster natural patterns of productive communal engagement alongside self-moderated experiences that really matter to learners. Today it is the users of the digital spaces and social media who show us how adept we are, as human beings, in using space and technology co-operatively when we feel a sense of purpose and ownership over our experience. The providers of institutional technologies have, for too long, tended to get bogged down in servicing knowledge delivery rather accommodating rich, blended learning experiences. In the studio, we learn early on that the technical space is only one context for our becoming and that relationships we form around us are critical to our learning behaviours and identities. This is something that others seem slow to understand.

This demonstration of collective imagination over social space reveals that we do make space work for us when we are given the chance. Space is not

agnostic. It matters to us, liberating us or tying us up. In education, this is referred to as built pedagogy.[15]

The studio affords the opportunity to create a balanced ecosystem that epitomises engagement through the authentic learning paradigm of 'legitimate peripheral participation'[16] : the inherent flexibility of the studio is not that bits and pieces can be moved around, but that we move around within the space to incorporate, with guidance, activities of practice as we learn at the edges of our community of practice. The studio is a shell in which students become practitioners by exploring common interests and purposes in ways that are meaningful personally alongside peers and mentors.

Learning networks and ecologies

The essential idea of a studio learning philosophy, whatever the discipline, begins by creating a dynamic situation of which each student is part. Studio, then, is the sum of the physical or digital space, its people and their individual and collective ambition, and the problems and opportunities they find. Together, these factors are volatile, generating interactivity, change and growth. The responses and relationships of the people in this equation particularly create a sense of fluid dynamism. In this context, each learner has agency and finds meaning.

The studio ethos exemplifies situated and experiential learning therefore. It is an ecological space being open to possibilities, shunning the binary conventions of formal and informal learning, and exemplifying networked behaviours. With reference to social media, BOYD[17:1] describes an understated interdependence of networked publics as ‘the imagined collective that emerges as a result of the intersection of people, technology, and practice... they allow people to gather for social, cultural, and civic purposes". Understanding the studio as a networked space, more than one of introspective communities, clarifies how the individual in the studio brings value as an autonomous co-operator. Each arrives into a dynamic learning space with their knowledge, experience, skills, dispositions and self-determined drive ready to work for the mutual benefit of their peer co-operators. Their histories are as diverse as their aspirations, but for a while

studio learners act as networked co-operators enjoying each other's wisdom and energies for mutual benefit.

More than communities, which are usually well-delineated and often inwardly orientated, networks are inherently nodal, co-operative, unbounded and fluid, being knitted together through loose ties. Because of social media, there is a new intensified personalisation and concurrent interdependency amongst young people in their use of digital space[18]. This is a state that will be familiar to many studio practitioners where the tension between the self and the social group is experienced as a false dichotomy. Even when we compare the Art studio to the Design studio where we have noted a difference of emphasis between the individual and the group, the studio is first and foremost an open plan fluid idea. The classroom and the lecture theatre are enclosures that exemplify hierarchical structures and are designed around teacher dependency, where the teacher is the leader and arbiter of knowledge. In contrast, the openness of the studio means it is essentially a networked construct situated around problems and opportunities that require the practitioner to work co-operatively in a socially-enmeshed space. Even the artist at their easel stands in the open being part of a supportive collective. The studio-based learner possesses, or develops, a different outlook and expectation of themselves and others as practitioners; an outlook embodied in the arrangement of the physical space, its histories, technologies and conventions.

The life class is perhaps an archetypal space for the art student. It works as a space for the individual in the context of the collective. A rather cosy space, warm enough to ensure the life model does not catch cold, Paul Kleiman describes how students, "sit in virtual silence, working individually, concentrating on looking closely and making marks on paper, with only the occasional quiet words of advice from the tutor to an individual student." The student is alone in their focus, with each one staking out their easel space to gain their angle on the model positioned in the centre of the studio as if in a forest clearing. He describes the fluctuations in the drama studio where performers work "sometimes noisily, sometimes quietly", but immersed nevertheless. In both cases it reflects what happens in a networked space

where there is a balanced awareness and frisson of engagement between the mass players.

For a dancer like Roisin Cahalan, the studio has equal potency, evoking for her memories of “sprung varnished floors covered in non-slip Marley. Mirrors on one wall, bars along the others. Music system in the corner and lots of hot, sweaty dancers.” For Roisin, the studio is a space of action and freedom. But the artist’s, dramatist’s and dancer’s studios share this strong sense of being, of intense commitment, of being surrounded by a few defining tools and sometimes a degree of clutter, but always a sense of pending achievement. Roisin says of the dance studio, “It is a space for a community of like-minded people when nothing other than the dance is relevant or important;” a sentiment recognisable by any studio user. This is what Mihaly Csikszentmihalyi[19] calls ‘flow’, which is characterised by activities that are intrinsically rewarding, involving complete concentration on task, a transformation of time, and a blurring of actions and awareness.

Brown[20:18-19] says that students in studios “learn from the struggles, the missteps, and the successes of their peers.” The studio is about an enculturation into a practice.

Respondents have observed how studio-based learners learn iteratively, prepared to accept and respond to failure readily. It builds both tenacity and reflexive adaptability. They are driven by a desire for imagined perfection even though this desire is probably unrealisable given that success is ultimately determined by an unknowable audience. Studio learning, in this way, is partially shaped by a deep and authentic self-assessment that contrasts with superficial extrinsic drivers often used in other disciplines. The experience and struggle encountered through each piece of work or performance is absorbed and used to shape the learner’s self-efficacy, as well as building their knowledge. It is this self-exploration through a multitude of personal experiments that develops the learning habit of the studio-based practitioner. The learner-practitioner adopts the ways, knowledge, motivations and sensibilities of their practice through productive enquiry in a social setting.

Spaces of difference

Ellen Sims is clear that the studio has many meanings to those who use them. She has written about the studio being a signature pedagogy of art and design[21]. For her the studio provides a work space, office, library, a making space, an exhibition space, store, and archive.

These qualities are evident in Cork Lined Studios (http://www.corklinedrooms.com). Artist, Sharon Kivland shared a link to this project to which she has contributed. Initiated by Karen David, it presents the studios of over 50 contemporary artists through collections of annotated photographs. The practising artist's studio is revealed to be idiosyncratic and mostly a space of inspirational clutter made up of found and made objects.

For some, the studio is positioned as having a distinct purpose that scaffolds artist discipline and distinct ways of thinking and being. Penny, who responded to my survey, said that her studio environment needs to be different from the other environments she uses each day so she can consciously move from her "more bureaucratic tasks as an educator to a more productive and experimental set of actions."

Many of the respondents to my survey said that the artist's studio is frequently characterised by its clutter, whereas the design studio is characterised by its organisation, and the performance studio by its openness and lack of clutter. Others said you can think of the space itself as a technology that functions to accommodate the different ways it is used by the individual and its communities.

The designer's studio is a space of professional practice and Claire Lockwood, Head of Art & Design at Sheffield Hallam University, describes the learning space for her Design students as a space that steadily enculturates and supports them to become the designer they aspire to be. The renovated studio space at Hallam has been designed to replicate industry physically but also in the ways that students work with others. In the new development one of the greatest successes has been the proximity of academics to the students. She says, "Social spaces including shared kitchens have been designed into every floor. Food brings everyone together. It's where people talk." It seems that

before it is anything else, the studio is a way of being. Claire says, “A studio-based experience is different to other disciplines because it creates a safe environment for taking risks. Students feel like they can be creative. They can put things on the wall and they know this practise is valued. It gives them a sense of belonging and home.”

The studio bubble

Ellen Sims describes her experience of studio as a Fine Art student in a police state. She conveys a picture of the studio as a sanctuary and as a place of immense trust between the students and lecturing staff. Students would study in more formal and confrontational spaces and return to this studio sanctuary for long episodes of creative immersion. “This fluid coming and going … [established]… a more social learning experience, as did spending all day every day with scant breaks for lunch or coffee. Relationships with lecturing staff were also different - much less hierarchical, more informed by being wowed at the work they were producing alongside us in the same studio space.” She describes a reassuring conspiratorial culture supported by her lecturers who cut keys for the students so they had the freedom to come and go whenever they needed to. “Soon everyone was spending evenings and weekends in the studio. It was closer than a marriage, more intense than therapy - but probably played that role, too… We talked, talked, all the time.” Ellen remembers venturing forth from the studio, crossing the boundary into the dangerous hinterlands surrounding the studio to gather photographs and inspiration. The nascent artist identities of the students took shape in this safe and stimulating haven. “Tacit, implicit forms of learning were far more important than explicit forms. We all had a sense of being both teacher and learner, assessor and assessed, involved in a shared venture.” Although Ellen’s studio was situated amidst testing social conditions, other artists and musicians talk about the special bonding they feel in which communication seems to happen at an instinctive hyper-level. My own experience as a printmaker shares this idea of a privileged space, being set apart from the norm with special access to facilities and different kinds of trustful relationship. It also resonates with my experience of being in bands– a sense of tenacity, deprivation and “us against the world” in the cause of creativity.

Even in adversity Ellen says, “Nothing approximates the luxury afforded by the studio.”

Autonomy and freedoms to choose

Many contributors told me that the studio is about high degrees of autonomy and freedom to pursue ideas, sometimes without clear purpose and structure. However, accounts describe a shift in the learning studio across educational levels that markedly affect the culture as students get more experienced and confident with the space. Simon Rae recalls how eventually “students were left alone to get on with whatever they wanted to do using whatever medium they chose… talk with whoever, and use whatever.” Giving students freedom is challenging and Simon says that, “unfortunately many students dropped out and left. Being a Fine Artist is a tough business.”

Stimulating the inner world

Kerry Bertram, a fine artist, responded to my question in her blog post[22] titled ‘Inner studio’. She says that all she needs is an inspiring space, where space is as much head space as physical. It should be "full of light, pattern, colour and things that spark ideas." She can imagine this, and that should be enough for her, although she also acknowledges the importance of the studio as a space to make the imagination concrete through visualisation or journaling: in effect, the process of challenging the imagination to make ideas real. Making real requires materials, tools, and surfaces to work on, but these do not need to inhibit creativity for her, often being to hand or freely available in the world. A studio in Kerry's mind is the combination of inspiration, resources and a space that may only need to be temporal or psychological. The physical world is subservient to these.

A place of skills for the making of cultural artefacts

The studio can also be a functional space: A place for making. Norman Jackson, reflecting on making music and producing animations, highlighted the significance of technologies. The technical environment challenges the artist or performer to respond. He says, “In ecological terms, the space encourages and facilitates the sorts of relationships and interactions necessary for the making of such artefacts.” Julius Dobos, a Distinguished Professor of Digital Audio

Technology, focuses on the studio as, “a place where hands-on creative work happens, which typically involves two or more individuals. To me studio refers to a place where creativity is at work, manifesting [a] creator[s]' ideas that will ultimately spread outside of the physical boundaries of the studio.” I do not think that a ‘studio’ has to involve any sort of technology.”

A place of becoming and placemaking

The studio is an ontological space. A place that is made through learner agency. John Cowan proposes the studio is, “A place, empty when first occupied, where you can work creatively, shaped according to the kind of activity that will happen within it.” This shares Kerry Bertram’s view of the studio as a space relatively devoid of meaning until imagination and action affect it. The studio is a space that tempts the artist or performer to give it meaning. As such, the studio is a locus of placemaking and the creative act itself gains value only when it engages others.

Properties of the studio learning space

The essential philosophy and practice of the studio continues to reflect longstanding practices and cultures in disciplinary areas such as art, design, architecture, media, drama, dance and music. A studio, whatever the discipline, is a material space that supports a studio-based learning philosophy that resembles and scaffolds professional practices. In this space students accept challenges which they explore through research and experimentation by focusing on designing, producing and then presenting their responses. These can be individual or collective works and performances and, as such, they require the review and feedback of tutors, peers and publics.

Educationally, the studio continues to mean:

- a space in which individual craft, knowledge and dispositions are valued;
- a space designed to promote creative thinking and originality;
- an immersive networked place of individual effort and collective agency;
- a place of co-operation and co-production; a cauldron of ideas, technologies and people.

Above all, a studio affords, for people who know how to use it, the space in which they can create their own ecologies for learning, exploring, developing, creating/co-creating, making, performing and achieving. [23]

Studios for all: enhancing opportunities for active and engaged learning

As we reshape higher education for an unknown future, institutions of higher education are paying much more attention to the types of spaces that promote active engaged learning. The steady development of higher education as a discipline in its own right and the attention given to developing graduate attributes through the curriculum[24] have demanded a wider appreciation of the ontological learning space. These changes in the way we are thinking about learning in higher education open up new possibility space for the expansion of studio-based learning.

At the same time, the supremacy of epistemological knowledge has been usurped by the accessibility of the internet; knowledge grows and is promulgated exponentially, challenging the paradigm of knowledge retention[25]. Further, the unreliability and disputability of factual knowledge and what we accept as credible, seems set to define our times as an age of uncertainty with the political denial of research evidence. All this means that the university teacher must be increasingly concerned with developing critical thinking amongst their students. This demands the use of strategies in which the learner is actively engaged in iteratively scrutinising knowledge by tackling problems creatively, and developing their own knowledge in the process, and then reflecting on the validity of knowledge developed through their activity.

So far, I have tried to establish the studio as a learning space with a different pedagogical tradition to other more didactic pedagogies of disciplines that do not use studio spaces in their teaching and learning practices. I have described these respective pedagogic traditions as running in parallel. However, there are signs in some universities as they rethink their learning spaces, and we shift from a teaching paradigm to a learning paradigm that studio-type learning environments are becoming more widely available. I do not suggest the studio is an ideal learning space, having pedagogic challenges to do with managing informality and 'hidden rules of engagement'[26] however, a growing interest in

active learning classrooms[14] suggests a studio-type philosophy is becoming more attractive to teachers in disciplines that have traditionally not utilised studio spaces or pedagogies.

Adopting a *Studio for All* philosophy for developing higher education learning spaces resonates with the ambitions and aspirations of our students to lead creative, rich, rewarding and fulfilling lives. Smith Taylor[27] has observed how exposure to a studio space "can launch teachers into active learning pedagogy and can increase the positive effects of that pedagogy on learning." The challenge facing higher education in delivering a *Studio for All* philosophy, however, is a lack of experience and understanding of active, student-centred teaching, yet its execution needs the conviction to ensure that large numbers of students grasp the opportunity. However vibrant the active studio is, we have seen how the studio is a challenging space; one not immediately suited to all students.

Nevertheless, the studio speaks of situated knowledge and a graduate fluency that Schön[1] calls 'a tacit kind of knowing'. These suggest the time is right to explore how the studio learning space might be used to good effect across disciplinary curriculum experiences.

But perhaps another question might be, where do learners in disciplines that do not use studio spaces, gain the sorts of experiences for authentic exploration, learning and creativity afforded by the studio environment?

Acknowledgements & credits

I am grateful to all the people who contributed to my survey and shared their views on what studio means in the #creativeHE *Google+* Forum[4] – Norman Jackson, Paul Kleiman, John Cowan, Simon Rae, Julius Dobos, Declan Phillips, Kerry Bertram, Roisin Cahalan, Ellen Simms and Fred Garnett

References

1 Schön, D. A. (1984). The architectural studio as an exemplar of education for reflection-in-action. Journal of Architectural Education, 38(1), Autumn, 2-9.

2 Dunton, C (2016) Collaborative Learning Ecologies: A novel pedagogy for fostering creativity across disciplines Creative Academic Magazine CAM7A p21 available at: http://www.creativeacademic.uk/magazine.html

3 The Hive Centre for Student Creativity Creative Academic Magazine CAM7C p.69 May 2017

4 Middleton A (2017) Studio for All survey of views. #creativeHE Forum July-August 2017 https://plus.google.com/communities/110898703741307769041

5 Crowther, P. (2013). Understanding the signature pedagogy of the design studio and the opportunities for its technological enhancement. Journal of Learning Design, 6, pp. 1-11.

6 Drew, L. (2004) The experience of teaching creative practices: conceptions and approaches to teaching in the community of practice dimension. In: A. Davies, ed., "Enhancing curricula: towards the scholarship of teaching in art, design and communication." Proceedings of the 2nd International Conference, London, Centre for Learning and Teaching in Art & Design, pp.106–123.

7 Shreeve, A. & Batchelor, R. (2012). Challenges to learning and teaching relations in higher education studio environments. Networks, 18. Available online at: http://arts.brighton.ac.uk/projects/networks/issue-18-july-2012/art-designmedia-learning-and-teaching-projects-2011-12-final-reports/challenges-to-learning-and-teaching-relations-in-highereducation-studio-environments

8 Robbins (1963) Higher education: Report of the committee appointed by the Prime Minister under the Chairmanship of Lord Robbins London: Her Majesty's Stationery Office 1963. Education in England. Online at: http://www.educationengland.org.uk/documents/robbins/robbins1963.html

9 Plastic Arts http://encyclopedia2.thefreedictionary.com/Plastic+arts

10 Dewey, J. (1938/1963). Experience and education. New York: Collier Books.

11 Barr, R & Tagg, J. (1995). From teaching to learning: a new paradigm for undergraduate education, Change, November, 13-25.

12 Fry, H., Ketteridge, S., & Marshall, S. (2003) A handbook for teaching and learning in higher education: Enhancing academic practice, 3rd edition. Routledge, New York & London.

13 Kirchner, P. & Neelen, M. (2017, 11 July). 'Motivation for learning: Is there a point?' 3-Star Learning Experiences: an evidence-informed blog for learning professionals

14 Dittoe, W., & Porter, N. (2007). Appealing spaces. American School and University, 79. Available online at: http://asumag.com/Furniture/university_appealing_spaces/

15 Monahan, T. (2002). Flexible space and built pedagogy: Emerging IT embodiments. Inventio, 4(1), 1-19. Online at: http://www.torinmonahan.com/papers/Inventio.html

16 Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge, Mass.: Cambridge University Press.

17 boyd, d. (2010). Social network sites as networked publics: affordances, dynamics, and implications. In: Papacharissi, Z., ed., 'Networked self: Identity, Community, and Culture on Social Network Sites', pp. 39-58.

18 Ryberg, T. & Larsen, M.C. (2008). Networked identities: Understanding relationships between strong and weak ties in networked environments. Journal of Computer Assisted Learning, 24, pp. 103-115.

19 Csikszentmihalyi, M. (1996). Creativity: Flow and the psychology of discovery and invention. Harpercollins.

20 Brown, J.S. (2006). New learning environments for the 21st century: exploring the edge. Change, September/October, pp. 18-24.

21 Sims, E. & Shreeve, A. (2012). Signature pedagogies in Art and Design. In N. L. Chick, A Haynie and R A R Gurung, Exploring More Signature Pedagogies: Approaches to teaching disciplinary habits of mind Stylus 55-67

22 Bertram, K. (2017). Inner studio. Blog post, 8 August 2017, Time to Release. Online at: https://timetorelease.wordpress.com/2017/08/08/inner-studio/

23 Jackson, N.J. (2017) An ecological perspective on studio spaces. Creative Academic Magazine CAM7D (October) available at: http://www.creativeacademic.uk/magazine.html

24 Barrie, S. (2006). Understanding what we mean by the generic attributes of graduates. Higher Education: The International Journal of Higher Education and Educational Planning. 51(2), 215-241.

25 Russell Schilling, D. (2013). 'Knowledge doubling every 12 months, soon to be every 12 Hours'. Industry Tap blog, 19th April 2013. Online at: http://www.industrytap.com/knowledge-doubling-every-12-months-soon-to-be-every-12-hours/

26 Shreeve, A. & Batchelor, R. (2012). Designing relations in the Studio: Ambiguity and uncertainty in one to one exchanges. Design and Technology Education: An International Journal, 17(3), pp. 20 - 26.

27 Smith Taylor, S. (2009). Effects of Studio Space on Teaching and Learning: Preliminary Findings from Two Case Studies. Innovative Higher Education, 33 (4), pp 217-228.

Bibliography selected from Middleton (2018)

ALC (2007). Active Learning Classrooms Pilot Evaluation: Fall 2007 Findings and Recommendations. University of Minnesota. Online at: http://www.classroom.umn.edu/projects/alc_report_final.pdf

Alexander, B. (2004). Going nomadic: mobile learning in higher education. *EDUCAUSE review*, September/October 2004. https://net.educause.edu/ir/library/pdf/ERM0451.pdf

APA (2000). Diagnostic and statistical manual of mental disorders, text revision (4th ed.). Washington, DC: American Psychiatric Association.

Attwell, G. (2007). Personal Learning Environments - the future of eLearning? *elearning Papers*, 2(1). Online at: http://www.informelles-lernen.de/fileadmin/dateien/Informelles_Lernen/Buecher_Dokumente/Attwell_2007-ple.pdf

Austerlitz, N., Blythman, M., Grove-White, A., Jones, B.A., Jones, C.A., Morgan, S., Orr, S., Shreeve, A., & Vaughan, S. (2008). Mind the gap: expectations, ambiguity and pedagogy within art and design higher education. In: L. Drew (ed.) 'The student experience in art and design higher education: drivers for change', 125-148. Cambridge: JRA Publishing.

Bandura, A. (1977). Social learning theory. Englewood Cliffs, NJ: Prentice Hall.

Barnett, R. (2010). 'Lifewide education: a transformative concept for higher education? In: N. Jackson, ed., Learning for a complex world: a lifewide concept of learning, education and personal development. Bloomington, IN: Authorhouse.

Barrie, S. (2006). Understanding what we mean by the generic attributes of graduates. Higher Education: The International Journal of Higher Education and Educational Planning. 51(2), 215-241.

Baxter Magolda, M. (2004). Evolution of a constuctivist conceptualization of epistemology reflection. Online at: http://citl.indiana.edu/files/pdf/baxter_1.pdf

Beichner, R. (2008). The SCALE-UP project: a student-centered active learning environment for undergraduate programs. An invited white paper for the National Academy of Sciences, September 2008. Online at: http://physics.ucf.edu/~bindell/PHY%202049%20SCALE-UP%20Fall%202011/Beichner_CommissionedPaper.pdf

Belcher, J. (2001). Studio physics at MIT. MIT Physics Annual. Online at: http://web.mit.edu/jbelcher/www/PhysicsNewsLetter.pdf

Bermann, J. & Sams, A. (2012). Flip your classroom: reach every student in every class every day. Washington DC and Virginia: ISTE and ASCD.

Bilandzic, M. & Foth, M. (2017). Designing hubs for connected learning: social, spatial and technological insights from coworking, hackerspaces and meetup groups. In: Carvalho, L., Goodyear, P., & de Laat, M. (Eds.) Place-based spaces for networked learning. Routledge, Oxon, United Kingdom, 191-206.

Blackmore, J., Bateman, D., Loughlin, J., O'Mara, J., & Aranda, G. (2011). Research into the connection between built learning spaces and student outcomes. Department of Education and Early Childhood Development, East Melbourne, Victoria. Deakin University Research Repository. Online at: http://dro.deakin.edu.au/eserv/DU:30036968/blackmore-researchinto-2011.pdf

Blaschke, L. (2014). Using social media to engage and develop the online learner in self-determined learning. Research In Learning Technology, 22. doi:http://dx.doi.org/10.3402/rlt.v22.21635.

Bonwell, C. C., & Eison, J. A. (1991). Active learning: creating excitement in the classroom (ASHE–ERIC Higher Education Rep. No. 1). Washington, DC: The George Washington University, School of Education and Human Development.

Brandt, C., Cennamo, B., Douglas, K., Vernon, S., McGrath, M., & Reimer, M. (2013). A theoretical framework for the studio as a learning environment. *International Journal of Technology and Design Education, 23*(2), 329-348.

Brookes, M. & Becket, N. (2009). Personalising student learning experiences. Proceedings of EuroCHRIE, 27th EuroCHRIE Annual Conference, Helsinki, Finland, 21-24 October 2009. Online at: http://www.eurochrie.org/ downloads/EuroCHRIE2009-PROCEEDINGS-final.pdf

Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. Educational Researcher, 18(1), 32-42.

Brown, J.S. (2006). New learning environments for the 21st century: exploring the edge. Change, September/October, 18-24

Brown, J.S. (1999). Learning, working, and playing in the digital age. Online at: http://serendip.brynmawr.edu/sci_edu/seelybrown

Bruff, D. (2010). Backchannel in education: nine uses. Agile Learning, [blog post] January 21, 2010. Online at: http://derekbruff.org/?p=472.

Bruner, J. S. (1960). The process of education. Cambridge, Mass.: Harvard University Press.

Burke, D.D. (2015). Scale-up! Classroom design and use can facilitate learning. The Law Teacher, 49(2), 189-205.

Carlson, S. (2015). The maker movement goes to college: institutions gamble on open workshops as engines of entrepreneurship. *The Chronicle of Higher Education*, April 20, 2015, 61 (32).

Carnahan, C., Musti-Rao, S. & Bailey, J. (2009). Promoting active engagement in small group learning experiences for students with autism and significant learning needs. Education and Treatment of Children, 32(1), 37-61.

Carvalho, L. & Goodyear, P. (2014). The architecture of productive learning networks. Abingdon and New York: Routledge.

Castells, M. (2001). The Internet galaxy: reflections on the Internet, business, and society. Oxford: Oxford University Press.

Cavanaugh, A.J. & Song, L. (2014). Audio feedback versus written feedback: instructors' and students' perspectives. MERLOT Journal of Online Learning and Teaching, 10(1), March 2014.

Conboy, M. (2013). Journalism studies: the basics. Oxon: Routledge

Cormier, D. (2008). Rhizomatic education: community as curriculum. *Innovate: Journal of Online Education*, 4(5), June/July 2008, article 2. Online at: http://nsuworks.nova.edu/ cgi/viewcontent.cgi?article=1045&context=innovate

Couros, A. (2010). Developing personal learning networks for open and social learning. In: Veletsianos, G., ed., Emerging technologies in distance education. Athabasca University Press, 109-128. Online at: http://educationaltechnology.ca/couros/1156

Craft, A. (2010). Possibility thinking and fostering creativity with wisdom: opportunities and constraints in an English context. In: Bhegetto, R., Kaufman, J. (eds). Nurturing creativity in the classroom. Cambridge: Cambridge University Press, 289-312

Cronin, C. (2014). Networked learning and identity development in open online spaces. Proceedings of the 9th International Conference on Networked Learning 2014, Bayne S., Jones C., de Laat M., Ryberg T. & Sinclair C., eds. Online at: http://www.lancaster.ac.uk/fss/ organisations/netlc/past/nlc2014/abstracts/pdf/cronin.pdf

Cronin, C., Cochrane, T., & Gordon, A. (2016). Nurturing global collaboration and networked learning in higher education. Research in Learning Technology, 24. doi:http://dx.doi.org/10.3402/rlt.v24.26497

Cropper, C. (2017). Facilitating innovation through collaboration: Central Teaching Laboratories' Education Brokers. Presentation at Media-Enhanced Learning Special Interest Group, 'Digital Placemaking: how we use media across our learning spaces', 31st May 2017, Host: Edge Hill University.

Cropper, C., Vaughan, H., Clements, R. & Mistry, M. (2016). Cropper, C (2016) Trialling the use of Tablet PCs in Undergraduate Physical Science Laboratories. In: ViCE PHEC, 2016-08-25 - 2016-08-26, University of Southampton.

Cross, J. (2007). Informal learning: rediscovering the natural pathways that inspire innovation and performance. San Francisco: Pfeiffer.

Crowther, P. (2013). Understanding the signature pedagogy of the design studio and the opportunities for its technological enhancement. *Journal of Learning Design*, 6, 1-11.

Daskalaki, M., Butler, C.L., & Petrovic, J. (2012). Somewhere in-between: narratives of place, identity, and translocal work. *Journal of Management Inquiry*, October 2012; 21(4), 430-441.

Davidts, W & Paice K (eds) (2009). The fall of the studio. *Artists at Work*, Valiz, Amsterdam.

Davies, D., Rogerson-Revell, P. & Witthaus, G. (2009). An exploratory study of speech styles in audio feedback to M-level students. A Word in Your Ear Conference. Online at: http://research.shu.ac.uk/lti/awordinyourear2009

Davis, C. & Ryder, A. (2009). Using an old technology in a new way or using a new technology in an old way? - exploring the use of audio feedback post-teaching observation. A Word in Your Ear Conference. Online at: http://research.shu.ac.uk/lti/awordinyourear2009

de la Harpe, B. & Peterson, F. (2008). Through the learning and teaching looking glass: what do academics in art, design and architecture publish about most? *Art, Design & Communication in Higher Education*, 7(3), 135 - 154. doi: 10.1386/adche.7.3.135/1

Deleuze, G. & Guattari, F. (2004). A thousand plateaus: capitalism and schizophrenia, trans. Brian Massumi, Minneapolis: University of Minnesota Press, 1987 (originally published as Mille plateaux, Paris: Éditions de minuit, 1980).

Delphenich, P., & Broz, D. (2015). Garage innovation + higher education = the academic incubator. *Planning for Higher Education*, 43(4), 10-12.

Dewey, J. (1938/1963). Experience and education. New York: Collier Books.

Digital Pedagogy Lab (2013). A bill of rights and principles for learning in the digital age. Online at: http://www.digitalpedagogylab.com/hybridped/bill-rights-principles-learning-digital-age/

Dittoe, W., & Porter, N. (2007). Appealing spaces. *American School and University*, 79. Online at: http://asumag.com/Furniture/university_appealing_spaces/

Dlab, M. & Hoić-Božić, N. (2009). An approach to adaptivity and collaboration support in a web-based learning environment. *International Journal of Emerging Technologies in Learning*, 4, 28- 30. doi:10.3991.ijet.v4s3.1071.

Dori, Y. J. & Belcher, J. (2005). How does technology-enabled active learning affect undergraduate students' understanding of electromagnetism concepts? *The Journal of Learning Science*, 14(2), 243-279

Dosen, A., & Ostwald, M. (2013). Methodological characteristics of research testing prospect–refuge theory: A comparative analysis. Architectural Science Review, 56(3), 232-241.

Downes, S. (2011). Free learning: essays on open educational resources and copyright. Stephen Downes Knowledge Learning Community website. Online at: http://www.downes.ca/files/books/FreeLearning.pdf

Edwards, B. (2014). University architecture. London: Taylor & Francis Ltd.

ELI (2013). 7 things you should know about makerspaces. EDUCAUSE. Online at: https://net.educause.edu/ir/library/pdf/eli7095.pdf

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. British Journal of Educational Psychology, 70, 113 - 136.

Feltham, M. & Keep, C. (2015). Oh, the places you'll go — smart learning in the natural sciences. In: A. Middleton, (ed.) "Smart learning: teaching and learning with smartphones and tablets in post compulsory education." MELSIG and Sheffield Hallam University.

Finelli, C. J., Daly, S. R., & Richardson, K. M. (2014). Bridging the research-to-practice gap: designing an institutional change plan using local evidence. Journal of Engineering Education, 103(2), 331-361. DOI: 10.1002/jee.20042

Fox, S. (2002) Networks and communities: an actor–network critique of ideas on community and implications for networked learning. In: S. Banks, P. Goodyear, V. Hodgson & D.

McConnell (Eds) Networked learning 2002: a research based conference on e-learning in higher education and lifelong learning (Sheffield, University of Sheffield), 110–118.

France, D., Whalley, W. B., & Mauchline, A. (2013). Using mobile devices to enhance undergraduate field research. *CUR Quarterly.* 34 (2) p. 38-42.

France, D., Whalley, W.B., Mauchline, A., Powell, V., Welsh, K., Lerczak, A. & Park, J. (2015). Enhancing Fieldwork Learning Using Mobile Technologies, *Springer Briefs*.

Freeman, S., Eddy, S.L., McDonough, M., Smith, M.K., Okoroafor, N., Jordt, H., & Wenderoth, M.P. (2014). Active learning increases student performance in science, engineering, and mathematics (psychological and cognitive sciences). Report. *Proceedings of the National Academy of Sciences of the United States,* 111(23), p. 8410.

Garrison, D. R., & Vaughan, N. (2008). Blended learning in higher education: framework, principles, and guidelines. San Francisco: Jossey-Bass.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: computer conferencing in higher education model. *The Internet and Higher Education*, 2(2-3), 87-105.

Gennep, A. van (1909/1960). The rites of passage. *Reprint*, London: Routledge & Kegan Paul.

Giddens, A. (1992) The transformation of intimacy. Sexuality, love and eroticism in modern societies. Cambridge, Polity Press.

Gold, J.R. (1991). Fieldwork. In: Gold, J.R., Jenkins, A., Lee, R., Monk, J., Riley, J., Sheppard, I. & Unwin, D., (eds) *Teaching Geography in Higher Education: A manual of good practice*. Oxford: Blackwell, 21– 35.

Gould, J. & Day, P. (2013). Hearing you loud and clear: student perspectives of audio feedback in higher education. Assessment and Evaluation in Higher Education, 38 (5), 554-566.

Gutiérrez, K. D., Baquedano-López, P., & Tejeda, C. (1999). Rethinking diversity: hybridity and hybrid language practices in the third space, *Mind, Culture, and Activity*, 6(4), 286-303, DOI: 10.1080/10749039909524733

Halverson, E. R., & Sheridan, K. M. (2014). The maker movement in education. Harvard Educational Review, 84(4), 495-504.

Hamilton, M. (2000). Sustainable literacies and the ecology of lifelong learning. Paper presented at “Supporting Lifelong Learning: A Global Colloquium”, London, England, July 5-7, 2000. Online at: http://files.eric.ed.gov/fulltext/ED445251.pdf

Hancock, P. & Spicer, A. (2011). Academic architecture and the constitution of the new model worker, Culture & Organization, 17(2) pp. 91-105.

Harrison, A. & Hutton, L. (2014). Design for the changing educational landscape: space, place and the future of learning. London: Routledge.

Harrop, D. & Turpin, B. (2013). A study exploring learners' informal learning space behaviours, attitudes, and preferences. New Review of Academic Librarianship, 19(1). 58-77

Hatziapostolou, T. & Paraskakis, I. (2010). Enhancing the impact of formative feedback on student learning through an online feedback system. Electronic Journal of e-Learning, 8 (2), 111-122.

HEFCE (2009). Enhancing learning and teaching through the use of technology: a revised approach to HEFCE's strategy for e-learning. Online at: http://www.hefce.ac.uk/pubs/year/2009/200912/

Heron, J. (1996). Co-operative inquiry: research into the human condition. London: Sage.

Herrington, A., Herrington, J. & Mantei, J. (2009). Design principles for mobile learning. In: Herrington, J., Herrington, A., Mantei, J., Olney, I. & Ferry, B., eds., New technologies, new pedagogies: Mobile learning in higher education. University of Wollongong, Wollongong, 129-138. Online at: http://researchrepository.murdoch.edu.au/5229

Herrington, J. (2012). Authentic learning and authentic e-learning. Interactive website exploring the dimensions of authentic learning. Available online: http://AuthenticLearning.info/AuthenticLearning/

Herrington, J., Parker, J. & Boase-Jelinek, D. (2014). Connected authentic learning: reflection and intentional learning. *Australian Journal of Education*, 58(1) 23–35.

Hoffman, E. (2009). Social media and learning environments: shifting perspectives on the locus of control. *In Education*, 15(2).

Hovorka, A. J., & Wolf, P. A. (2009). Activating the classroom: geographical fieldwork as pedagogical practice. *Journal of Geography in Higher Education*, 33, 89 – 102.

Huggins, C., & Stamatel, J. (2015). An exploratory study comparing the effectiveness of lecturing versus Team-based Learning. *Teaching Sociology*, 43(3), 227-235.

Hutchins, E. (1996). Cognition in the wild. Cambridge, MA: MIT Press.

Ito, M., Gutierŕez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J., & Watkins, S.C. (2013). Connected learning: an agenda for research and design. Online at: http://dmlhub.net/sites/ default/files/Connected_Learning_report.pdf

Jackson, N. (2016b). Background paper 'Exploring Creative Ecologies' #creativeHE. Online at: http://www.creativeacademic.uk/uploads/1/3/5/4/13542890/ concept_of_a_creative_ecology.pdf

James, A. & Brookfield, S.D. (2014). Engaging imagination: helping students become creative and reflective thinkers. San Franscisco: Jossey-Bass.

Jarvis, P., Holford, J. & Griffin, C. (1999). Theory and practice of learning. London: Kogan Page.

Jenkins, M. & Gravestock, P. (2009). Digital storytelling synthesis: a Higher Education Academy-funded Enhancing Learning and Teaching through the use of Technology Synthesis Project. Online at: https://www.heacademy.ac.uk/system/files/digital_storytelling_synthesis _19th_november_2009.docx

Jenkins, M. & Lonsdale, J. (2008). Podcasts and students' storytelling. In: Salmon, G. & Edirisingha, P., eds. (2008). Podcasting for learning in universities. Maidenhead: Open University Press, 113-120.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1991). Cooperative learning: increasing college faculty instructional productivity. *ASHE-ERIC Higher Education Report No. 4.* Washington, DC: George Washington University, School of Education and Human Development.

Johnston, M. (2014). The Photobook Club and generative pedagogy. Hybrid Pedagogy, 22nd January 2014. Available on at: http://www.digitalpedagogylab.com/hybridped/photobook-club-generative-pedagogy/

Johnson, S. (2010). Where good ideas come from: the natural history of innovation. London: Penguin.

Jones, C. (2004a). The conditions of learning in networks. In: L. Dirckinck–Holmfeld, B. Lindström, B. M. Svendsen & Ponti, M. (Eds.) 'Conditions for productive learning in networked learning environments.' Aalborg: Aalborg University/Kaleidoscope. Online at: http://www.ell.aau.dk/index.php?id=60.

Jones, C. (2004b). Networks and learning: communities, practices and the metaphor of networks. ALT-J, 12(2), 81-93.

Kandiko, C. B. & Mawer, M. (2013). Student expectations and perceptions of higher education: executive summary. London: King's Learning Institute.

Kim, Glassman, & Williams. (2015). Connecting agents: engagement and motivation in online collaboration. Computers in Human Behavior, 49, 333-342.

Kolb, D. A. (1984). Experiential learning: experience as the source of learning and development, vol. 1. Englewood Cliffs, NJ: Prentice-Hall.

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1973). Taxonomy of Educational Objectives, the Classification of Educational Goals. Handbook II: Affective Domain. New York: David McKay Co., Inc.

Kukulska-Hulme, A. (2010). Mobile learning as a catalyst for change. *Open Learning*, 25 (3), November 2010, 181-185.

Lambert, J. (2009). Where it all started: the Center for Digital Storytelling in California. In: Hartley, J. & McWilliam, K., eds, Story circle: digital storytelling around the world, Chichester: Wiley-Blackwell. pp79-90

Laughton, D. (2013). Using audio feedback to enhance assessment practice: an evaluation of student and tutor experiences. Student Engagement and Experience Journal, 2(2). DOI 10.7190/seej.v2i2.68.

Lave, J. & Wenger, E. (1991). Situated learning: legitimate peripheral participation. Cambridge

Linsey, T. & Hall, R. (2010). Mobilising Remote Student Engagement: the MoRSE Project, Final Report. Joint Information Systems Committee. http://bit.ly/1Gd4Cq3

Little, B., Locke, W., Scesa, A. & Williams, R. (2009). Report to HEFCE on student engagement. HEFCE, Bristol, UK. Online: http://oro.open.ac.uk/ 15281/1/Report_to_HEFCE_on_student_engagement.pdf

Lombardi, M. (2007). Authentic learning for the 21st century: an overview. EDUCASE Learning Initiative, May 2007. Online at: https://net.educause.edu/ir/library/ pdf/ELI3009.pdf

Losh, E. (2014). 'Phonar: a massive, free, open photography class'. DML Central blog, Thursday, January 23, 2014. Online at: http://dmlcentral.net/phonar-a-massive-free-open-photography-class/

Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., Cook, J., Day, P., Eccesfield, N., Hamilton, T., & Robertson, J. (2011). Learner-generated contexts: a framework to support the effective use of technology for learning. In: M.J.W. Lee & C. McLoughlin "Web 2.0-based e-Learning: applying social informatics for tertiary teaching. Hershey: Information Science Reference, 70-84.

Malcolm, J., Hodkinson, P. & Colley, H. (2003). Informality and formality in learning: a report for the Learning and Skills Research Centre. Learning and Skills Research Centre.

Maloney, E. J. (2007). What Web 2.0 can teach us about learning. The Chronicle of Higher Education, 53(18), p. B26.

Meadows, D. & Kidd, J. (2009) Capture Wales@: the BBC digital storytelling project. In: Hartley, J. & McWilliam, K., eds, 'Story circle: digital storytelling around the world'. Chichester: Wiley-Blackwell., 91-117.

Megele, C. (2015) eABLE: embedding social media in academic curriculum as a learning and assessment strategy to enhance students learning and e-professionalism. Innovations in Education and Teaching International, 52 (4), 414-425.

Megele, C. (2014a). ENABLE: developing e-professionalism and embedding social media and technology enhanced learning in higher education curricula. MELSIG, 9 September 2014, University of Sussex. Presentation Online at: http://www.slideshare.net/ClaudiaMegele/enable-professionalismand leaderfullearningepedagogymelsiguniversityofsussex9september2014

Megele, C. (2014b). Theorising Twitter chat. *Journal of Perspectives in Applied Academic Practice*, 2(2), 46-51.

Mejias, U. (2005). A nomad's guide to learning and social software. Online at: http://jotamac.typepad.com/jotamacs_weblog/files/a_nomads_guide_to_learning_and_socia l_software.pdf

Memarovic, N., Fels, S., Anacleto, J., Calderon, R. , Gobbo, F. & Carroll, J. (2014). Rethinking Third Places: contemporary design with technology. *Journal of Community Information*, 10(3). Online at: http://ci-journal.net/index.php/ciej/article/view/1048/1116

Meyer, J., Land, R. & Baillie, C., eds. (2010). Threshold concepts and transformational learning. Rotterdam: Sense Publishers.

Meyer, J.H.F. & Land, R. (2003). Threshold concepts and troublesome knowledge: linkages to ways of thinking and practising. In: Rust, C. (ed.), Improving Student Learning - Theory and Practice Ten Years On. Oxford: Oxford Centre for Staff and Learning Development (OCSLD), pp 412-424.

Middleton, A. (2017). Studio for all: perspectives on the pedagogy and ecology of studio-based learning. Creative Academic Magazine, 'Exploring Creative Pedagogies for Creative Learning Ecologies', 7D July-October 2017, 31-38. Online at: http://www.creativeacademic.uk/uploads/1/3/5/4/13542890/cam7d.pdf

Middleton, A. (2016). Reconsidering the role of recorded audio as a rich, flexible and engaging learning space. *Research In Learning Technology*, 24. doi:http://dx.doi.org/10.3402/rlt.v24.28035

Middleton, A. (2015b). Smart learning: teaching and learning with smartphones and tablets in post-compulsory education. Sheffield: MELSIG and Sheffield Hallam University.

Middleton, A. (2009). Beyond coursecasting. *ALT-J, Research in Learning Technology*, 17(2), 143–155.

Middleton, A., ed. (2013). Digital voices: a collaborative exploration of the recorded voice in post-compulsory education. Media-Enhanced Learning Special Interest Group & Sheffield Hallam University.

Middleton, A., Nortcliffe, A. & Owens, R. (2009). iGather: learners as responsible audio collectors of tutor, peer and self-reflection. A Word in Your Ear Conference. Online at: http://research.shu.ac.uk/lti/awordinyourear2009/docs/Middleton-Nortcliffe-Owens-iGather_final.pdf

Miller, A, (2009). How to get your ideas adopted (and change the world). London: Marshall Cavendish Ltd.

Neary, M. (2015). On the authority of the HE teacher: student as producer: authority and authorship in authoritarian times. In Lea, J. (ed.) (2015). Enhancing learning and teaching in higher education: engaging with dimensions of practice. Maidenhead & New York: Open University Press/McGraw-Hill Education.

Neumann, R., Parry, S. & Becher, T. (2002) Teaching and learning in their disciplinary contexts: a conceptual analysis. *Studies in Higher Education*, 27:4, 405-417, DOI: 10.1080/0307507022000011525

Newth, M. (2016). Territories of practice and the fall of the studio: expanding space for risk, collaboration and agency. National Association for Fine Art Education (NAFAE) Annual Symposium for Fine Art Educators, “The Hidden Curriculum”, 22 January 2016, London.

Niblock, S. (2013). Media professionalism and training. Basingstoke: Palgrave Macmillan.

Niemi, H. (2002). Active learning: a cultural change in teacher education and schools. Teaching and Teacher Education, 18, 763-780.

Oldenburg, R. (1989). The great good place: Cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day. New York: Paragon House.

Olesova, L., & Richardson, J. (2011). Using asynchronous instructional audio feedback in online environments: A mixed methods study. MERLOT Journal of Online Learning and Teaching, 7, 30–42. March 1983.

O'Rourke, V. & Baldwin, C. (2016). Student engagement in placemaking at an Australian university campus. Australian Planner, 1-14.

Orr, S. (2010). Collaborating or fighting for the marks? Students’ experiences of group work assessment in the creative arts. *Assessment & Evaluation in Higher Education*, 35(3), 301-313.

Orton-Johnson, K. (2014). Rethinking community? Facebook as a learning backchannel. In: M. Kent & Y. Leaver “An education in Facebook?: higher education and the world’s largest social network. New York, NY & Abingdon, UK: Routledge.”

Pahl, K. & Rowsell, J. (2005). Literacy and education: understanding the new literacy studies in the classroom. London: Paul Chapman.

Pallasmaa, J. (1992). Identity, intimacy and domicile: notes on the phenomenology of home. Proceedings of ‘The Concept of Home: An Interdisciplinary View’ Symposium, 21-23, August, Trondheim, Norway. Available online: http://www.uiah.fi/studies/history2/e_ident.htm

Pearce, N. (2014). Challenges and opportunities in using Facebook to build a community for students at a UK University. In: Mike Kent and Tama Leaver, eds., An Education in Facebook? Higher Education and the World’s Largest Social Network, London and New York: Routledge.

Picbod Google+ learning community. Online at: https://plus.google.com/communities/107224455320300602147

Rao, S. & Gagie, B. (2006). Learning through seeing and doing: visual supports for children with autism. Teaching Exceptional Children, 38, 26-33.

Rao, V. (2008). Facebook applications and playful mood: the construction of Facebook as a third place. In MindTrek '08: Proceedings of the 12th international conference on Entertainment and media in the ubiquitous era, 8-12.

Richardson, W. & Mancabelli, R. (2011). Personal learning networks: using the power of connections to transform education. Bloomington, IN: Solution Tree Press.

Rogers, E.M. (1962/2003). Diffusion of innovations, 5th edition. New York: Free Press.

Ross, C., Terras, M., Warwick, C. & Welsh, A. (2011). Enabled backchannel: conference Twitter use by digital humanists. Journal of Documentation, 67(2), 214-237.

Rushton, D., Malone, C. & Middleton, A. (2015). Digital posters: talking cycles for academic literacy. In: Lillis, T., Harrington, K., Lea, M. and Mitchell, S., eds, Working with Academic Literacies: Research, Theory, Design. 'Studies in Writing' series, editor Gert Rijlaarsdam, WAC Clearing House with Parlor Press.

Ryan, R. M., & Deci, E. L. (2000a). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55 (1), 68–78. doi:10.1037/0003-066X.55.1.68.

Sambell, K., McDowell, L., & Montgomery, C. (2013). Assessment for learning in higher education. London & New York: Routledge.

Salmon, G. (2013). E-tivities: the key to active online learning. Routledge.

Savin-Baden, M. (2015). Rethinking learning in an age of digital fluency: Is being digitally tethered a new learning nexus? London & New York: Routledge.

SCHOMS, AUDE & UCISA (2016). The UK Higher Education Learning Space Toolkit: a SCHOMS, AUDE and UCISA collaboration. Universities and Colleges Information Systems Association. Online at: http://www.ucisa.ac.uk/learningspace.

Schön, D. A. (1987). Educating the reflective practitioner: toward a new design for teaching and learning in the professions. San Francisco: Jossey-Bass

Schön, D. A. (1985). The design studio: an exploration of its traditions and potentials. London: RIBA Publications.

Schön, D. A. (1984). The architectural studio as an exemplar of education for reflection-in-action. *Journal of Architectural Education*, 38(1), Autumn, 2-9.

Schön, D. A. (1983). The reflective practitioner: how professionals think in action. New York: Basic Books.

Selwyn, N. (2007) "Screw Blackboard... do it on Facebook!": an investigation of students' educational use of Facebook. Paper presented at Poke 1.0 - Facebook social research symposium, University of London.

Selwyn, N. (2009) 'Faceworking: exploring students' education-related use of Facebook', Learning, Media and Technology, 34(2), 157-174.

Selwyn, N. (2013). Distrusting educational technology: critical questions for changing times. London: Routledge.

Semetsky, I. (2004). The role of intuition in thinking and learning: Deleuze and the pragmatic legacy. *Educational Philosophy and Theory*, 36(4), 433-454.

Shank, G. (1993). Abductive multiloguing: the semiotic dynamics of navigating the Net. The Arachnet Electronic Journal on Virtual Culture, March 22, 1(1).

Sheridan, K.M., Halverson, E.R., Litts, B.K., Brahms, L., Jacobs-Priebe, L. (2014). Learning in the making: a comparative case study of three makerspaces. *Harvard Educational Review*, 84, Winter 4, 505-531.

Shortt, H. (2014). Liminality, space and the importance of 'transitory dwelling places' at work. Human Relations, 6, 1-26. DOI: 10.1177/0018726714536938

Shreeve, A., Sims, E. A. R., & Trowler, P. (2010). A kind of exchange: learning from art and design teaching. Higher Education Research and Development, 29(2), 125-138.

Shulman, L. S. (2005). Signature pedagogues in the professions. Daedalus; Summer 2005; 134, 3.

Siemens, G. (2008). New structures and spaces of learning: the systemic impact of connective knowledge, connectivism, and networked learning. Online at: http://elearnspace.org/ Articles/systemic_impact.htm

Siemens, G. (2005) Connectivism: a learning theory for a digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10. Online at: http://www.itdl.org/Journal/Jan_05/article01.htm

Sims, E. & Shreeve, A. (2012). Signature pedagogies in art and design. In: Chick, N.L., Haynie, A. & Gurung, R.A.R., Exploring more signature pedagogies: approaches to teaching disciplinary habits of mind. Sterling, Virginia: Stylus Publishing, 55-67.

Smith Taylor, S. (2009). Effects of Studio Space on Teaching and Learning: preliminary findings from two case studies. Innovative Higher Education, 33 (4), p. 217–228

Stewart, B. (2013). Massiveness + openness = new literacies of participation? MERLOT Journal of Online Learning and Teaching, 9(2).

Stirling, E. (2014). "We use Facebook chat in lectures of course!": exploring the use of a Facebook Group by first-year undergraduate students for social and academic support. In: Mike Kent & Tama Leaver, eds., *An Education in Facebook? Higher Education and the World's Largest Social Network*, London and New York: Routledge.

Studio Teaching Project (2015) website. Online at: http://www.studioteaching.org/

TEAL website: http://icampus .mit.edu/projects/teal/

Thomas, L. (2012). What works? - student retention and success. Building student engagement and belonging in higher education at a time of change. York: Higher Education Academy. Online at: https://www.heacademy.ac.uk/sites/default/files/what_works_final_report.pdf

Tosey, P. (2006). Interfering with the interference: an emergent perspective on creativity in higher education. In: N. Jackson, M. Oliver, M. Shaw & J. Wisdom, Developing creativity in higher education: an imaginative curriculum. London and New York: Routledge, 29-42.

Traxler, J. (2016). Context reconsidered. In: J. Traxler & A. Kukulska-Hulme, eds., Mobile learning: the next generation. New York & London: Routledge.

Traxler, J. (2009). Learning in a mobile age. *International Journal of Mobile and Blended Learning*, 1(1), 1—12.

Traxler, J. (2007). 'Defining, discussing and evaluating mobile learning: the moving finger writes and having writ … . *The International Review of Research in Open and Distributed Learning*, 8(2).

Tucker, R. & Reynolds, C. (2006). The impact of teaching models, group structures and assessment modes on cooperative learning in the student design studio. *Journal for Education in the Built Environment*, 1(2), 39—56.

Tversky, B. (2003). Structures of mental spaces: how people think about space. Environment and Behavior, 35(1), 66.

Valenti, M. (2015). Beyond active learning: transformation of the learning space. *EDUCAUSE Review*, July/August, 31-38.

Vygotsky, L. S. (1978). Mind in society: the development of higher psychological processes. Cambridge, MA: Harvard University Press.

Weinberger, D. (2002). Small pieces loosely joined: a unified theory of the web. Cambridge, MA: Perseus Publishing.

Welsh, K. E., Mauchline, A. L., Powell, V., France, D., Park, J. R., & Whalley, W. B. (2015). Student perceptions of iPads as mobile learning devices for fieldwork. *Journal of Geography in Higher Education*, 39(3), 450-469.

Wenger, E. McDermott, R. & Snyder, W.M. (2002b). Seven principles for cultivating communities of practice. HSBWK. Online at: http://cpo.wisc.edu/wp-content/uploads/2014/08/seven-principles-for-cultivating-communities-of-practice.pdf

Whalley, B. W., France, D., Park, J. R., Mauchline, A. L., Powell, V. & Welsch, K. (2015). iPad use in fieldwork: formal and informal use to enhance pedagogical practice in a bring your own technology world. In: Souleles, N. & Pillar, C., eds, Proceedings of the 1st International Conference on the use of iPads in higher education (ihe2014). Cambridge Scholars Publishing, 110-125. ISBN 9781443876261 Available at: http://centaur.reading.ac.uk/38078/

White, D. & Le Cornu, A. (2011). Visitors and residents: a new typology for online engagement. *First Monday*, 16(9). Online at: http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/3171/3049

Wiley, D. (2014). 'The access compromise and the 5th R' blog post, [Blog] *Iterating toward openness*. Online at: http://opencontent.org/blog/archives/3221

Williams, J. (2014). The design studio as liminal space. *Charrette*, 1(1), Summer 2014.

Wilmot, N., Rushton, D., & Zandona Hofmann, A. (2016). Reaching across continents: engaging students through virtual collaborations. *Higher Education Pedagogies*, 1(1), 121-139.

Wiltwhatman (2013). #twitterteach tip #10 Livetweet your lecture notes. Online blogpost, 23 September 2013: https://50waystotwitterteach.wordpress.com/2013/09/23/twitterteach-tip-10-livetweet-your-lecture-notes/

Withagen, R., Araujo, D., & de Poel, H. J. (2017). Inviting affordances and agency. New Ideas in Psychology, 45, April 2017, pp. 11-18.

Wong, Y.J. (2003). Harnessing the potential of problem-based learning in legal education, *Law Teacher*, 157, 37(2), 160.

Zhu, Y., & Bargiela-Chiappini, F. (2013). Balancing emic and etic: situated learning and ethnography of communication in cross-cultural management education. *Academy of Management Learning and Education*, 12, 380-395

Žubrini, K. & Kalpi, D. (2008). The web as personal learning environment. *International Journal of Emerging Technologies In Learning*, 3, 45-58. doi:http://dx.doi.org/10.3991/ijet.v3i0.576

Section 3: Appendices

Appendix 1 List of Chapters from Reimagining Spaces for Learning in Higher Education

This table lists the chapters from my book *Reimagining Spaces for Learning in Higher Education*. It shows if they are used in this thesis and presents an abstract for omitted chapters.

Used?	Chapter Title	Chapter Description
No	Preface: Where do you learn?	Defines the conceptual scope of 'spaces for learning' by asking the reader to reflect on the places that stimulate their own learning.
No	1 Space to think	Introduces *Reimagining Spaces for Learning in Higher Education* and its exploration of how learning and space work together in the digital-social age towards a conceptualisation of a hybrid learning space. It considers how the lived learning experience is affected by the built and digital context and how we, as teachers, students, managers and developers, must look more closely at space to ensure learning remains engaging, challenging and relevant to the development of knowledge, lifelong capabilities and habits. It challenges binary conceptualisations of learning and space to instead develop an appreciation of their continua and crossing points that together generate the nuances affecting learning space.
No	2 Space to learn	Introduces Barr and Tagg's principle-based Learning Paradigm (1995) to clarify what is meant by learner-centredness; the philosophy underpinning thinking about spaces for learning. It reviews educational theorists from the twentieth century and then

		turns to more recent concepts that reframe the learning paradigm for the digital-social age which support the concept of the hybrid learning space.
No	3 Renegotiating the lifewide learning landscape	The value of non-formal space is presented as a useful construct for space in which learning is experienced individually and socially beyond formal teaching spaces. The meanings and implications of formal provision, flexible learning, non-formal learning, friendship and belonging, social presence, learning context, and 'place' are all explored. A hybrid view of learning space as being pervasive, augmented and learner-centred is developed.
Yes	4 In-between spaces	C1
No	5 Open spaces	Considers how open education and connected learning space challenge traditional views of universities as being well-demarcated. Openness is both threatening and inspiring. It has many meanings which provide opportunities for the educator to consider how university learning is situated, how actions and knowledge can be related to meaningful contexts, and how the ways that people learn can reflect how people work (Brown *et al*., 1989).
No	6 Being an academic innovator	Considers how innovation is a necessary response to change and its criticality to the design and adoption of new spaces for learning.
No	8 Being open and flexible	Considers spaces that support autonomous learning in which learning is situated within

		real, lifewide and lifelong experiences. It aims to help us think differently about learning in an age when universities are exposed to external disruptive forces that have changed other professions beyond recognition.
No	9 Being digital: literacies, capabilities and fluency	Being digitally literate requires much more than being skilled in using digital technologies. Digital literacies are about being digitally-minded in study, work and life and, like academic literacies more generally, are integral to today's learning landscape. The chapter charts the digital literacies discourse since it emerged in the early 2000's and then reviews contemporary understandings. It concludes by summarising digital literacies as a dimension of the lifewide hybrid learning space.
Yes	10 Being social: the connected learning space	C2
Yes	11 Being mobile	C3
Yes	12 Being smart	C4
Yes	13 Being rich: learning in the age of YouTube	C5
Yes	14 Being there: active learning spaces	C6
Yes	15 Future learning spaces: context and connections	C7

Appendix 2 – List of case studies

This appendix lists and provides a brief description of the case studies developed and integrated within *Reimagining Spaces for Learning in Higher Education* so that studies embedded in the chapters which are not reproduced in this thesis, but referenced in the thesis' commentaries, are explained.

	Included	**Case Study Subjects and Title**	**Description**
1	No	Ann-marie Steele & Stella Jones-Devitt: Our own space on our own terms	Describes the experience of a group of part-time mature nursing students and their autonomous response to their feeling of displacement.
2	No	Noel Rodgers: The life of a mature student	Describes the spatial needs and campus experience of a mature student with caring responsibilities.
3	No	David Smith: The lab as a place of becoming	Describes the science lab as a multi-dimensional home space, a place of embodied skills and know-how, and a place in which lab groups become friendship circles.
4	Yes	David Clarke and Julie Gillin: Facebook learning through real-world scanning	Chapter: In-between spaces
5	Yes	Sarah Honeychurch and Shazia Ahmed: Using Facebook groups for virtual Peer Assisted Learning	Chapter: In-between spaces
6	Yes	René Meijer: The role of the 'learning architect'	Chapter: In-between spaces
7	No	Viv Rolfe: Inspired by the open	Describes the subject's use and advocacy for Open Educational

			Resources shared for the benefit of disciplines globally rather than resources owned to differentiate institutions.
8	No	David Eddy: EPCC MOOC – co-production through conversation	Describes the development of a Massive Open Online Course by integrating social media applications and behaviours.
9	No	Anne Nortcliffe: The art of working around and connecting across systems	Describes the mindset of the innovator.
10	No	Toby Carter: Stories of innovation – letting our students surprise us	Describes how ill-formed assignment briefs can create space for students to negotiate their approach and lead to innovative demonstration of the intended learning outcomes.
11	No	Shaun Hides: Growing innovation in the Disruptive Media Learning Lab	Describes how a culture of academic innovation was developed by establishing an innovation lab.
12	No	Pauline Nugent: The pub as learning space	Describes the qualities of non-formal spaces for learning established by the community-led *Philosophy in Pubs* network.
13	No	Jill Lebihan: The serendipitous art of browsing and forming narratives as a learning space	Considers the difference of learning through happenstance in analogue and digital environments
14	Yes	Sue Beckingham: LTHEchat – the use of tweetchats	Chapter: Being social: the connected learning space

15	Yes	Sara Smith: Students building their own space – the RONC revision group	Chapter: Being social: the connected learning space
16	Yes	Charlotte Burton: Facebook Groups as self-regulated Third Space learning sets	Chapter: Being social: the connected learning space
17	Yes	Matt Johnston: Photobook Club	Chapter: Being social: the connected learning space
18	Yes	Derek France: Teaching and learning in the field	Chapter: Being mobile
19	Yes	Natalie Wilmot and Diane Rushton: The global learning space	Chapter: Being mobile
20	Yes	Gary Wood: Allaboutlinguistics.com learner-generated online learning resource	Chapter: Being rich: learning in the age of YouTube
21	Yes	Ollie Jones and Terese Bird: TeachMeAnatomy	Chapter: Being rich: learning in the age of YouTube
22	Yes	Beryl Jones: Anonymous engagement through Snapchat interaction	Chapter: Being rich: learning in the age of YouTube
23	Yes	Kieran McDonald and Ian Glover: Studio-based beacons	Chapter: Being there: active learning spaces
24	Yes	David Fairhurst: SCALE-UP	Chapter: Being there: active learning spaces

Appendix 3 - Markup codes for selected publications

A1 - Beyond podcasting: creative approaches to designing educational audio

A2 - Audio Active: Discovering Mobile Learner-Gatherers from Across the Formal-Informal Continuum

A3 - Reconsidering the role of recorded audio as a rich, flexible and engaging learning space

C1 - In-between spaces

C2 - Being social: the connected learning space

C3 - Being mobile

C4 - Being smart

C5 - Being rich: learning in the age of YouTube

C6 - Being there: active learning spaces

C7 - Future learning spaces: context and connections

A4 - Studio for All - perspectives on the pedagogy and ecology of studio-based learning