

Reimagining learning by playing with paradox and ambiguity

Prof. Andrew Middleton, Anglia Ruskin University

Abstract

Higher education depends upon binary articulations to explain its role, strategies and methods. This paper explores some of the paradoxes that result from this and the apparently contradictory and self-defeating nature that results in an impoverished pedagogy at a time when imaginative pedagogies are needed. (Barnett, 2012) In a time of great global flux, the effect of paradox in higher education is considered and the role of ambiguity is explored as a disruptive framing for reimagining higher education learning environments and practices. An analytical review of pedagogic innovations is presented as vignettes drawn from longitudinal research into the use of digital technologies, media-enhanced learning spaces, and multimodalities. With reference to 'pedagogies of ambiguity' associated with studio-based learning (Vaughan et al. 2008), the paper concludes by making the case for embracing ambiguity as the basis for a contemporary conception of pedagogy in which individuals are instilled with greater agency.

Keywords: ambiguity, pedagogy, innovation, disruption

Introduction

This paper explores the paradoxical nature of higher education and the effect of paradoxical tension on its readiness to adapt to a period of global flux. Our students must develop the skills they need to survive and thrive in a world characterised by global political and economic instability, unrest and war, migration, climate change, the advent of AI, and the long shadow of the COVID pandemic. Volatility, uncertainty, complexity and ambiguity (VUCA) suggest that what we teach, how we teach, and where we teach need to be reimagined if education is to keep pace with what our students need as learners and becoming graduates.

The paper considers the paradoxical tensions that exist in the ways universities structure, enact, evaluate and discuss their educational role. It asks, can educators imagine and put in place an alternative learning paradigm to develop student adaptability and ensure they have the graduate skills they need to engage with a world characterised by its volatility and complexity?

Answering these questions directs pedagogic innovators to consider the role of digital technology and media in a multimodal learning paradigm.

The next section introduces the framing of volatility, uncertainty, complexity, and ambiguity (VUCA) as a mechanism for understanding this flux. This is followed by a closer examination of the paradoxical positions that characterise higher education and which seem to obscure and undermine our ability to reimagine higher education.

The paper then presents several vignettes as the basis for discussing how a multimodal pedagogic paradigm can be used to develop skills and dispositions that foster the graduate qualities needed for engaging with a world in flux.

Volatility, uncertainty, complexity, and ambiguity

The volatility of change, its uncertainties, complexity, and ambiguity create a challenge for education. VUCA exerts its influence on every field of human activity, including education. Panthaloorkaran (2022, p. 235) describes its effect as being evident in “feelings of insecurity, decline of creativity and erosion of trust and paralysis.” VUCA is seen in the features of an increasingly interconnected world challenged by exacerbating environmental conditions, severe economic challenges, geopolitical crises and the fluctuating expansion and contraction of globalisation, and the uneven distribution of wealth (Heinonen et al., 2017). To expand upon this, volatility reflects the rapid, distributed, and dynamic nature of change, the abundant generation of data, and the challenge of managing and using it. Uncertainty is evident in accounts of exceptional, unprecedented, and unpredictable experiences, and the invalidity and unreliability of knowledge. Complexity is experienced in situations where factors form a multidimensional, interconnected, and interdependent ecology. Ambiguity characterises the world as being undefinable, ill-formed, needing continual analysis and negotiation. As Brodie (2019) asserts, it is no longer viable to simply to draw upon decision-making strategies from the past to guide current and future thinking, instead, graduates and leaders need new skills to contend with VUCA in this rapidly iterating ecosystem. VUCA establishes a problem for higher education, its modalities and methods. While pedagogic innovation has persistently investigated the opportunity of digital technologies since the 1990s, such research has struggled to fully grasp, communicate, and convince managers, teachers, and students that educational technology is anything other than a delivery tool. A multimodal lens challenges this and allows us to consider strategies that embrace ‘pedagogies of ambiguity’ (Vaughan et al., 2008). Ambiguity means something that can be understood in more than one way and though this pedagogical concept comes from studio-based learning, a pedagogy that positively tackles the undefinable and ill-formed, and the need for continual analysis and negotiation of alternative and authentic spaces can help educators to imagine and commit to developing learning environments in

which the student has agency as navigator, negotiator, and curator in their learning. A multimodal lens reveals the student as they weave in, out and across formalities and boundaries, as discussed later.

This vision of the digitally and spatially fluent undergraduate student is easily dismissed, however. Our systems, both material and digital, are rooted in our history and the expectations that our students will 'attend' and academics will 'deliver'. There is a paradox in how education has aspired to develop flexible student-centred pedagogies for many years (e.g. Ryan & Tilbury, 2013; Knowles, 1975; Tough, 1971), yet we still struggle to escape the inflexibilities of the transactional education system we have inherited.

A pedagogy of paradox

A paradox is an apparently self-contradictory statement or situation which nevertheless expresses a possible truth.

Barnett (2012) describes how higher education's reputation is founded upon being monolithic, rigorous, fixed, and certain. It exudes resilience and, in this, an intransigent complacency. Indeed, he describes how ideas about higher education are impoverished and narrowing, although a seldom heard underground of imaginative thinking about its role and methods is never far away. Achieving change is difficult, but possible, if educators are open to being innovative. (Connell, 2019; Jackson *et al.*, 2006; Barnett, 2012; Christensen & Eyring, 2001). Barber *et al.* (2013) warn that external factors necessitate changes in how universities position themselves in the market and through their pedagogical practices to deliver employability and efficiencies. This encapsulates the paradoxical culture and challenge educators face: an expectation that higher education can cut its high-quality cloth to make it go further. If there is an inherent contradiction in this, it is explained by a persistent belief that digital innovation will be part of any solution. (*ibid*)

The massification of higher education in the UK that followed publication of the Dearing Report (NCIHE, 1997) has shifted long-standing perceptions about a UK university education as being a romantic ideal of glittering spires, eccentric professors, notions of 'education for education's sake' and simply a life experience (Connell, 2019) towards a sector in service to national prosperity and monitored through measures for research impact and graduate employability. Nevertheless, in the meantime, the realities of the staff and students, their aspirations, assumptions, practices, infrastructure and reputations remain hard to unravel and shift.

Others may present higher education in different terms and with different emphasise, however Barnett's proposition of an impoverished sector in search of alternatives is sustained as external conditions grow in their volatility, uncertainty, complexity, and ambiguity. (Rodriguez & Rodriguez, 2015) This need for innovation in a time of flux provides the basis for considering paradox and ambiguity in the context of higher education and its pedagogic relationship with digital modalities today.

The paper next considers how education's dependence on binary thinking propagates a confusion of paradox.

Paradox in holding binary propositions

Paradox is often seen in the need and desire of educators to measure quality, often using essentially quantitative methods. This is central in the concern considered by Berger and Wild (2016) who set out the problem of binaries, or Bayesian thinking, and how they create a pretence of reliability. Illustrated through their case of teaching critical reasoning in Law, they explain how legal argument relies upon an interplay of the qualitative, subjective argument or hypothesis and, at the same time, the authority and sense of indisputable certainty given by quantitative or positivist positions. They argue, however, that "states of quality and quantity are not mutually exclusive" (*ibid*, p. 57) and describe how a person's beliefs are informed by their view and interpretation of the world as they experience it, thus requiring them to make leaps of faith to commit to representations of truth. The paradox here is that people readily accept polarities as being definitive, reliable and useful while, at the same time, knowing how people invariably draw different conclusions from the same evidence base. Multiple truths inevitably coexist due to contextual differences and signature methodological biases.

This example helps to establish the problem being addressed in this paper: while apparently objective representations of truth are convenient and subjective realities are rich but not generalisable, in reality knowledge is inherently complex and volatile. In education, when evaluating our systems and pedagogies, we are inevitably considering experiential matters including those that affect the diversity found in the signature pedagogies of disciplines (Shulman, 2005; Chick *et al.*, 2012; Gurang *et al.*, 2009) and of our students. This essential diversity defines the educational authentic context and explains why a higher education cannot be as monolithic, rigorous, fixed, and certain as it may be presented.

Ways of learning, coming to know (Barnett, 2009), critical thinking and reasoning teach us that knowledge is more reliably understood as having an essential authenticity and vibrancy, sitting between, across and beyond what is often presented simply in terms of polarities. This is generally understood by educators, but it holds significant implications for reimagining pedagogy, the student experience, and the environments educators use.

Many dichotomous positions are discussed in the literature (Middleton, 2018), but the following short list is relatively familiar and indicative of the common binary devices many educators depend upon:

- Quantitative or qualitative methods and measures
- Assessment 'of' or assessment 'for' learning
- Teaching or learning
- Formal or informal space
- Online or in-person

The following section teases open these problematic examples of binary propositions. This helps to establish the problem that must be embraced when pursuing needed pedagogic change.

1. Measuring learning

As noted in the example above, quantitative data and methods exist within an essentially subjective paradigm and can appear to serve contextual biases, be a means to an end, or a 'tyranny of transparency'. (Vaughan *et al.*, 2008)

Equally, a qualitative datum is unreliable on its own. It can only indicate a truth until validated by other data. Educational researchers know that reliable knowledge sits between, across, and amongst polarities and is elicited using mixed methods to investigate pedagogy and experience. Similarly, the use of mixed and multimodal pedagogies suggests some directions for pedagogic innovation.

A quality education is inhibited by its measurability. This can be addressed through mixed methods research in education. For example, the significance of abduction is often overlooked and the use of deviant case analysis and giving due attention to negative cases, can be revelatory. More

comprehensive accounts can come from identifying inconsistencies, paradoxes, or contradictions in the data, and seeking to explain them. (Edmunds & Brown, 2013)

2. Assessment for learning

The second example focuses on the role of assessment in higher education. While much discussed by educationalists in the literature since the 1990s (Sambell *et al.*, 2013; Price *et al.*, 2012; Bloxham & Boyd, 2007; Boud & Falchikov, 2006; Nicol & MacFarlane-Dick, 2006; Brown & Knight, 1994), assessment practices and systems continue to be anchored in the summative paradigm of assessment *of* learning. (Brown, 2022) Summative assessment is primarily concerned with making judgements about whether a student's learning has been achieved. Typically, summative assessment using a limited palette of tried and tested assessment methods. Designs fixate students and tutors on the award of marks which are used to inform the student, the awards panel, and situations beyond the programme of study. They drive surface levels of learner engagement and provide little opportunity for learning to continue as attentions move on. (Sambell *et al.*, 2013)

Assessment *for* learning emphasises a different purpose with methods being an integral part of a transformative, active and authentic learning experience. Student engagement in a group project assignment, for example, involves students responding to a problem brief through collaborative deliberation in pursuit of their goal. Through problem analysis, they apply what they know to create a product that represents the culmination of their knowledge, skills and thinking. As such, it tends to be less transactional and superficial with its methods offering students more opportunity for learning through personalised inquiry. However, it also present greater challenges in terms of more complex and time-consuming marking.

Paradoxically, the massification of education appears to make it more difficult to use high quality assessment *for* learning strategies in ways that consistently engage and challenge all students all the time. As in the previous example, the need to optimise the making of reliable judgements about learning serves to undermine the quality of the intended learning.

3. Creating space for teaching or for learning

Education confuses teaching and learning. While they are not mutually exclusive, these terms are often used interchangeably. Consequently, the significant distinction between the teaching paradigm and the learning paradigm (Barr & Tagg, 1995) is lost resulting in the perpetuation of institutional systems and culture that favours a teaching-centred world. This is despite an extensive

legacy of educational research that makes a sound case for student-centred, experiential and situated learning (e.g. Dewey, 1938; Lavé & Wenger, 1991; Ryan & Deci, 2000). Our lecture theatres, classrooms, and timetabling systems, for example, continue to frame teaching and learning in hierarchical terms, even when our education strategies and standards advocate engagement, interaction, challenge and diversity, for example. It seems there is a mismatch between those who maintain educational systems (people, services, infrastructure, standards) and those educators committed to the pursuit of teaching excellence. Further, not enough time is spent on developing the expectations of students who, generally, believe that lecturers 'lecture', learning is 'delivered', and learning engagement can be measured through student attendance monitoring rather than evidence of actual participation or co-construction.

Paradoxically, while some progress has been made in the design of classrooms and online systems, the persistence of teaching-centred infrastructure and services anchors educators and students to the past. Our virtual learning environments are not designed for learning, but organisation, while our learning management systems imply that, ultimately, learning is a matter of systematisation.

4. Formality and non-formality

In a learning-centred paradigm the significance of in-between spaces, connectivity, boundary crossing, and liminal learning become clearer. These are the ambiguous spaces and interludes where students linger, socialise, compare notes, compare lives, and catch sight of role models and tutors. These are the familiar but unnoticed third places (Oldenburg, 1989) where knowledge and identity mature. These are the non-formal learning spaces in which students exercise their agency and mull over their learning and where learning becomes self-directed and self-regulated in relation to formal provision. (Eraut, 2000) Non-formal learning is that which is adjacent to the formal provision epitomised by timetabled classrooms, labs and lecture theatres. In this framing, space and its spatial affordances shape the student's experience and demands their spatial fluency – the person's confidence to successfully navigate and negotiate the situations they encounter. (Middleton, 2025) In thinking about digital and flexible learning, educators need to reimagine and add value to the adjacent spaces, where students go next, or where they are co-situated (campus, home, work, downtime, travelling), and the role that digital technologies and media can have in facilitating, personalising, connecting these realities.

5. On or off-line

The dichotomous presentation of online or in-person learning spaces directs us towards consideration of the digital setting as a site of paradox.

Explanations of blended, hybrid and hyflex learning environments have been reflected upon by educators where they have discussed the different experiences of academics and students through the 2020-21 pandemic lockdown, for example. (Dickinson & Griffiths, 2025; Eyal & Gil, 2022; Almpanis & Joseph-Richard, 2022) However, a postdigital consideration of digital space (e.g. Ball & Savin-Baden, 2022; Fawns, 2018), clarifies how distinguishing the digital from the material is of limited value.

People move with fluidity in, through and across diverse spaces (Ball & Savin-Baden, 2022) and, more than that, wherever they are and whatever time it is, our students will be connected to and possibly engaged in their life-wide responsibilities. Such connectivity requires that educators appreciate the complexities and agility of our students as they enact their agency, manage their continuous criss-crossing of life boundaries, perform with dexterity in handling technologies and media, enact their capabilities to find and analyse their own best pathways, negotiate responsibilities and relationships, shift modalities and identities, work and study synchronously and asynchronously, and analyse spatial affordances. (Middleton *et al.*, 2024)

It becomes clear by looking more closely at the lived experiences of our students that many already develop strategies for dealing with the VUCA problem in the ways they are already trying to manage their lives. (*ibid*) Multimodal pedagogies may better accommodate and support our students and give them a greater sense of agency. Time at university may be better conceived as a time for being creative and learning to take risks through acts of self-determination. Learning to negotiate options and evaluate outcomes may suggest how we can reimagine learning in an age of VUCA.

Beyond paradoxical tensions

The above exposition of higher education's binary thinking confirms its paradoxical tensions. The binaries reveal a pragmatic but 'good enough' attitude. It is not that education intentionally misrepresents its contexts or purpose, but that it nevertheless obscures, confuses and misdirects our attention. This obfuscation remains as a problematic discourse, especially when considering the disconnect between what education aspires to be and the reality it has, and the urgent challenge of education's role in a VUCA world.

Educators, therefore, need to question the reliability and sustainability of binary propositions, and seek alternative ways of framing its education. In the next section, the basis for developing a pedagogy of ambiguity is explored, and from this the paper will go on to review what ambiguity looks like in digital pedagogies and multimodal learning environments.

Developing a pedagogy of ambiguity

Ambiguity means something that can be understood in more than one way. This may suggest an acceptance of misrepresentation; on the contrary, a pedagogy of ambiguity is one of agency, critical reasoning, diversity, navigation, inquiry and interrogation, curation, interpretation, co-operation, proposition, collaboration, and negotiation. It is one that is familiar to studio-based disciplines in which ideas are 'explored'.

An ambiguous learning space is one that is unclear, and which allows for divergent thinking and outlier actions. Small and Schmutte (2022) address ambiguity as a matter embracing the unknown. They say ambiguity is about, "holding two ideas at the same time and understanding something in more than one way. It's about dualities, multiplicities, and active interpretation." (*ibid*, p. 19) They identify the value of ambiguity as not being about the ambiguous object itself, but as being to do with a person's response to the object. It does not equate to uncertainty or vagueness, which imply there is 'a certainty', rather, ambiguity has no single answer, and its value is best conceived as being a springboard for possibility thinking.

Studio-based pedagogies

The concept of 'pedagogy of abundance' comes from studies of studio-based learning. (Orr & Shreeve, 2018; Shreeve & Batchelor, 2013; Vaughan *et al.*, 2008) Vaughan *et al.* (2008, p.6) describe a "pedagogy of ambiguity, where skills are not simply competencies, but the ability to operate in the complexities of uncertainty." This involves an openness of brief that requires the student to actively engage in negotiation around problem solving, and critique.

A clear framing or 'brief' ensures the learner is confident enough to navigate and negotiate their learning as they go beyond technique to embrace provisional and socially constructed knowledge. Students learn through adventure, iteratively evaluating their responses to the problems they are given as they work through them. At the same time, much learning is tacit and felt through experience. This is central to studio-based learning in which a strong sense of co-operation exists alongside equally strong and passionate student commitments and self-direction. Such an

environment leads to the development of self-knowledge as much as factual, procedural or conceptual knowledge. The co-operative social dynamic of the studio as a learning space, whatever the discipline, is notable. (Middleton, 2017), However, Shreeve and Batchelor (2013) caution that the studio dynamic can go wrong when both student's and tutor's fail to navigate the ambiguous space appropriately, for example when the co-presence of students and tutors lead to mutable and often ambiguous relationships which are "uncertain in character" and "complicated by socio-cultural, political and spatial factors." (2013, p. 20) This surfaces a strength of multimodal approaches in which the negotiation of boundary crossing is pervasive.

The emphasis on the development of self-awareness and self-knowledge is fundamental to understanding why a multimodal learning environment can help to prepare our students as graduates in a VUCA world. This is explored further by looking at how fostering a sense of being and agency helps to reposition our pedagogical thinking and the role that digital media have to play.

Developing a sense of being

Paying attention to a person's sense of being in place or in time (Heidegger, 1962) helps us to notice and make significant the familiar but not-seen space in which we exist. It helps us to think about learning differently. Hitch and Pepin (2021) explain that being is different to doing, belonging or becoming. Being recognises the value of inherent skills and abilities and, in some framings, roles. In Hitch and Pepin's Pan Operational Paradigm (POP) model, as used by them in occupational therapy, being sits in relation to the other dimensions of doing, belonging and becoming. It is this relationality and acknowledgement of action as being multifaceted that is useful when thinking differently about learning; a positioning that helps us to broach paradoxical constructs.

Barnett (2009, p. 430) points to the value of being by distinguishing "between knowledge (existing as a collectively attested set of understandings in the world) and knowing (an individual's personal hold on the world)... [in which] the journey is at least if not more important than the arrival." He emphasises how education can be framed as a 'coming to know'. Being allows us to conceive learning from the perspective of experience and participation: enactment, embodiment, intrinsic motivations, and inclusive engagement.

Being can also be understood by looking at negative space; that which is not the subject or which is not in focus. It can be the in-between space, the space of counter intuition, or the space that creates important context.

A learning environment that puts fostering a sense of being in balance with and in relation to doing, belonging, becoming, and connecting, points us to ideas of a multimodal space. In the section that follows, the paper offers a set of ambiguous pedagogies in the form of digital pedagogy vignettes in which the use of media is less about conveying information and more about being present in the learning.

Ambiguous digital pedagogies

Understanding ambiguity in terms of an intentionally designed situation helps to explain how it can become a useful pedagogic framing. Further, the idea of creating divergent ambiguous learning experiences indicates how ambiguity can be harnessed to promote agency through exploratory learning.

The following series of short vignettes are drawn from studies conducted by the author since 2005. This review revisits explorations around the edges of pedagogical norms in which the digital dimension has been intentionally disrupted. As an academic innovator, the examples have often been developed with faculty academics who choose to sit outside the norm. Typically, the aim has been to extend expectations for what can be achieved in a student-centred, experiential learning environment. Specifically, in this analysis, the examples demonstrate how digital technologies, media and space can be applied to embrace the principles of ambiguity.

The vignettes are followed by a summary discussion in which the examples contribute to an analysis of how a digital pedagogy of ambiguity and multimodality can be used to help educators imagine rich spaces for learning.

1. Podcasts as a conversational space

Audio has been used with great versatility to create conversational spaces (Middleton, 2009; Sutton-Brady *et al.*, 2009) For example, Middleton and Acevedo (2023) describe how the use of a loose and liberating structure derived from the Surrealist game Exquisite Corpse scaffolds a space for deep conversations designed to accommodate exploratory deviations (metaphorically, the arms of the corpse) while concluding safely through a reflection about the implications of the twists and turns taken through the conversation (metaphorically, the stability of the thinking (the body's legs) and the steps that can be taken (the feet)).

2. Corridor feedback

Audio feedback is a versatile approach to providing student feedback on their assignments using the recorded voice. It is notable for its timeliness, and the sense of presence it conveys. (Middleton & Nortcliffe, 2010) The Corridor model of audio feedback demonstrates how digital media can be used to frame peer learning as part of a project-based learning strategy. (Middleton, 2011)

It involves pairs of student groups stepping out of the classroom to the neutral space of the adjacent corridor along with a recording device. The move from the formal 'teacher-owned' space to the non-formal adjacent corridor space is significant in terms of signalling and establishing a trustful exchange and shifting the setting to a non-academic and non-formal space that requires a different kind of learner responsibility. Each group is asked to give the other group some formative feedback on their project work at a milestone point. The feedback is given face-to-face, but using audio recorded on a personal device. Later, as part of their submission, groups are asked to rewind their peer feedback and explain how they applied the feedback to improve their work. Giving and receiving useful feedback is mutually beneficial and involves each group reviewing the meaning of the assessment criteria mid-project. Ambiguity is found in the non-formality of the space, the unusual nature of the socially directed task, and the sense of individual and collective responsibility.

3. Learning walks and twalks

A learning walk involves groups of people walking for an hour visiting a series of planned 'viewpoints'. Sometimes the spaces visited have significance to the challenges the group are given, but more often this is not stated explicitly. The group walks and talks for 10 minutes between viewpoint places discussing each challenge topic. The act of walking involves a myriad of conversations and deviations within the walking group. Walkers are encouraged to change their conversation partners as they move from one place to the next, seeding the serendipitous cross-pollination of ideas and adding to their collective sense of being and coming-to-know as their ideas flourish by being heard, shared and built upon. A twalk (*n.b.* a portmanteau of 'tweet-walk') extends the learning through the use of smartphones, social media hashtags and by incorporating the exchange of digital media 'answers' (photographs representing ideas and other observations made by walkers locally and in parallel synchronous walking groups globally). (Middleton, 2024) Ambiguity is found in the enactment of assemblage (Delanda, 2016): ambiguous ecologies in which the walker's autonomy as a wanderer is heightened as they move through and around the group, both in real life and by navigating the hashtag. The polycontextual duality of navigating and criss-crossing the online and in-person space of their own volition is empowering, yet unpredictable and ambiguous.

4. Campus, cafés, social media and lifewide learning

Part-time postgraduate nursing students struggled to establish a sense of belonging based upon their use of the institutional virtual learning environment. They found it an alien academic system, lacking in authenticity, being removed from their day-to-day nursing practice and their life outside of work. As a group they recognised their disconnection and agreed how much they valued their infrequent pre-class meetings which took place by mutual agreement in the campus cafeteria. They realised that social media could extend their co-present relationship, bridging their monthly visits to campus. As happened in the café, the students felt they could continue to compare notes on work life, home life, and study life. They could take their conversations in any direction whether it was supporting academic work or more personal matters as they got to know each other better. Ambiguity is found in their autonomous exploitation of the non-formal settings of the campus café and social media. (Middleton, 2018)

5. Field trips, outings, and wayfinding

Shreeve and Batchelor (2013) observe how the studio dynamic shifted and how the student and tutor relationships were altered when venturing beyond the studio on observational study trips and field trips to museums. Being together in different neutral places (the coach, outside, the museum, with unfamiliar people, etc) and being engaged through prolonged interaction in non-formal situations on an equal and more relaxed footing, was the basis for a renegotiated learning on a more human level. The same disruption is observed in the end-of-day socialising enjoyed by Geography students and their tutors on a field trip. However, ubiquitous personal smart technologies have disrupted such experiences. While making data capture and analysis more efficient, the distinct qualities of remote and outdoor special interest sites have been conflated with experience in other settings. In this vignette, it is the effect of the negative or inverse space in the social occasion that contributes to the participants' intense sense of being that is important. Whether in the pub or on the bus, students found themselves in disconnected non-hierarchical places (Oldenburg, 1989) that invited a special kind of renegotiation. (Middleton, 2018)

6. The role of the desk in studying from home

In a study of spatial fluency in the context of harnessing multimodalities, respondents were invited to take photographs or make screenshots of spaces they felt to be significant in their working day. Many respondents chose to share photographs of their desks at home. For those who work and study from home, the desk is a liminal space of negotiation and the personal computer, its screen, webcam and microphone, the portal that switches the individual from one identity to another. In the

photographs shared by respondents, significance was found in what happens *around* the central technology portal: its negative space. Physically located in the home, desks were clean, tidy, well-organised, ready for the day, or not. Desks were personalised with lucky charms and family mementos and portraits. Phones, desk lights, chargers, keyboards, mice, printers and an array of other peripherals, were often vying for space. Coffee cups, snacks, used cutlery, water bottles and dishes were prominent. Books, papers and reading glasses added to the cacophonies that were shared. While some workspaces were highly organised and others were not, the material space and the digital space coexist and intermingle in an ecology of ambiguity. (Middleton *et al.*, 2024)

Discussion

The paper began by establishing the problem of VUCA and the need for higher education to reconsider and reimagine its role. In the context of teaching and learning, it first questioned whether higher education is capable of changing so that our graduates are ready to engage with a world characterised by its volatility, uncertainty, complexity and ambiguity. Secondly, it questioned whether the sector has the ability to reassess and address its intrinsic paradoxes so that its desire to be flexible and student-centred can be realised. To do this it must begin by acknowledging how such paradoxical positionings promote a culture of intransigence which makes it difficult for educators to adopt flexible and forward-looking practices.

While the stated problem is huge and multifaceted, a focus on ambiguity suggests there are new ways to frame digital innovation in the postdigital age of ubiquitous and pervasive digital technologies and media. The review of studio-based learning demonstrated that clarity and pedagogic ambiguity are able to not only coexist, but that they must: a pedagogy of ambiguity can only work when it is established upon the trust that comes from clear yet liberating framing of the teaching and learning space and its purpose, and the relationships therein.

The vignettes describe digitally-enhanced pedagogies that together indicate how intentional digital interventions can be developed to create liberating structures and cultures for autonomous and self-directed learning. Digital technology should not be seen as the root of all solutions by any means: part of the problem we have is learning how to also critically moderate our dependence on the digital by identifying, creating and experiencing the negative spaces free from technologies. Digital media, in the examples given, demonstrate how technologies can disrupt existing methods and practices and the uncritical reliance education has on formal structures, spaces, and ideas about learning as transmission. Our learning environment must primarily challenge and empower our

students to develop agency over their learning and involve them in creatively and critically reviewing the way they see and use technology and space. Drawing upon research into spatial fluency (Middleton *et al.*, 2024), it is evident that a multimodal learning environment is one that recognises the agility of our students as navigators and negotiators of their complex lives. It is not realistic to compartmentalise learning. It is entangled through concurrent experiences of working, caring, and having other responsibilities and interests. Post-pandemic, this includes learning how to be together as peers and co-operators. Peer feedback methods, as discussed, and the sharing of media in the twalk vignette, model a form of trustful negotiation. Exposure to purposeful digitally mediated methods can help to break through social anxieties.

Similarly, attention to the digital voice through methods like audio feedback and podcasting amplifies the nuances of a personalised education, whether speaker or listener. Learning experienced through speaking, listening, and the co-creation of artefacts may centre attention on knowledge, but perhaps its greater value is to do with learning about being together, interaction, exchange through co-production, and how these interactions develop self-knowledge. In this way such media become a non-formal centre of learning experiences.

While digital technologies extend the reach and possibilities of a postdigital learning environment, some spaces are defined by the pared-back use of media ensuring that learning is focused on richly mediated interactions. In this context, personal smart devices, more than institutionally provided systems, continue to warrant more attention as studies have shown that many students are more dependent than ever on their small screen devices. (Middleton *et al.*, 2024) The vignettes demonstrate the viability of technology-enhanced conversational spaces, reinforcing the value of humanity and exchange in learning. They indicate the opportunities that exist now to harness the innate abilities of people to wander, think, share ideas, co-construct knowledge, support each other and arrive at destinations together, whether through consensus or not. Non-structured, non-formal and incidental spaces emerge as being significant, as formal spaces become less relevant and possibly a distraction for educators. Ambiguity exists within the non-formal realities our students experience and must be negotiated. The example vignettes indicate how personal technologies and social media habits can help to scaffold this non-formal learning.

The desk vignette serves to remind us of our innate and determined diversity and our desire to personalise our learning experience: technology may tend to assert itself, but learning is fundamentally a human experience that must be negotiated. The tangible and the tacit coexist but carry meanings that personalise our experience.

By disrupting the traditional dependence on a 'delivered' learning and focusing on a *multimodal* experience of negotiated material and digital spaces, and multiple formalities, we create a strong sense of shared responsibility for learning in which technologies can be a focus, a catalyst and a reason for interaction and self-direction, often while being only incidental to the situation. Finally, it is essential our graduates can draw upon their time at university to define themselves not only by their specific knowledge and skills, but by their self-knowledge as confident navigators, negotiators, and becoming professionals able to deal effectively with rapidly changing and uncertain situations in which complexity must be socially mediated. These are the qualities and skills graduates need on entering a VUCA world.

References

- Almpanis, T., & Joseph-Richard, P. (2022). Lecturing from home: Exploring academics' experiences of remote teaching during a pandemic. *International Journal of Educational Research Open*, 3(100133), 1–9. <https://doi.org/10.1016/j.ijedro.2022.100133>
- Ball, J. & Savin-Baden, M. (2022). Postdigital learning for a changing higher education. *Postdigital Science Education*, 4, 753–771. <https://doi.org/10.1007/s42438-022-00307-2>
- Barber, M., Donnelly, K. & Rizvi, S. (2013). *An avalanche is coming: Higher education and the revolution ahead*. Institute for Public Policy Research. Available online at: <https://www.ippr.org/articles/an-avalanche-is-coming-higher-education-and-the-revolution-ahead>
- Barnett, R. (2012). *Imagining the university*. New Studies in Critical Realism and Education Routledge Critical Realism. London: Routledge.
- Barnett, R. (2009). Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, 34(4), 429-440.
- Barr, R. & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, 13 – 15.
- Berger, D. & Wild, C. (2016). Refining the traditional flipped-classroom model to optimise student performance on undergraduate degree programmes. *Journal of Commonwealth Law and Legal Education*. 11 (1), pp. 57-70.
- Boud, D., & Falchikov, N. (2006). Rethinking assessment in higher education: Learning for the longer term. *Higher Education*, 52(3), 385-397. <https://doi.org/10.1007/s10734-005-0009-9>
- Brodie, V. K. (2019). *Disrupted leadership: strategies and practices of leaders in a VUCA world*. Pepperdine University.
- Brown, G. T. L. (2022). The past, present and future of educational assessment: A transdisciplinary perspective. *Frontiers in Education*, 7, 1060633. <https://doi.org/10.3389/feduc.2022.1060633>

- Brown, S. & Knight, P. (1994). *Assessing learners in higher education*. London: Kogan Page.
- Bloxham, S. & Boyd, P. (2007). *Developing effective assessment in higher education: A practical guide*. Maidenhead: Open University Press.
- Chick, N. L., Haynie, A., & Gurung, R. A. R, eds (2012). *Exploring more signature pedagogies: approaches to teaching disciplinary habits of mind*. Virginia, USA: Stylus.
- Christensen, C. M. & Eyring, H. J. (2001). *The innovative university. Changing the DNA of higher education from the inside out*. Idaho MA: Jossey-Bass.
- Connell, R. (2019). *The good university: what universities actually do and why it's time for radical change*. London: Bloomsbury Academic.
- Delanda, M. (2016). *Assemblage theory*. Edinburgh University Press.
- Dewey, J. (1938). *Experience and education*. New York: Macmillan.
- Dickinson, J. & Griffiths, T. L. (2025). The new artefacts: teaching development during the Covid-19 pandemic and implications for future practice. *Higher Education Research & Development*, 44(1), 133–146. <https://doi.org/10.1080/07294360.2024.2429435>
- Edmunds, S. & Brown, G. (2013). Undertaking Pedagogic Research using Qualitative Methods. In: Grove, M. & Overton, T. (eds) *Getting Started in Pedagogic Research within the STEM Disciplines*. University of Birmingham STEM Education Centre on behalf of the National HE STEM Programme, Birmingham.
- Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70, 113 – 136.
- Eyal, L. & Gil, E. (2022). Hybrid Learning Spaces: A three-fold evolving perspective. In: Gil, E., Mor, Y., Dimitriadis, Y., Köppe, C. (eds) *Hybrid Learning Spaces. Understanding Teaching-Learning Practice*. Springer, Cham. https://doi.org/10.1007/978-3-030-88520-5_2
- Fawns, T. (2018). Postdigital education in design and practice. *Postdigital Science Education*. 1, 132–145. <https://doi.org/10.1007/s42438-018-0021-8>
- Gurung, R. A. R, Chick, N. L., & Haynie, A., eds (2009). *Exploring signature pedagogies: approaches to teaching disciplinary habits of mind*. Virginia, USA: Stylus.
- Heidegger, M. (1962). *Being and Time*. New York: Harper & Row.
- Hitch, D. & Pepin, G. (2021). Doing, being, becoming and belonging at the heart of occupational therapy: An analysis of theoretical ways of knowing. *Scandinavian Journal of Occupational Therapy*. 28(1), 13-25. doi: 10.1080/11038128.2020.1726454.
- Lavé, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Jackson, N., Oliver, M., Shaw, M. & Wisdom, J., eds (2006). *Developing creativity in higher education*. London: Routledge.
- Knowles, M. S. (1975). *Self-directed learning: a guide for learners and teachers*. New York, NY: Follett.

- Middleton, A. (2025). Spatial fluencies: acts of navigation and negotiation in the postdigital learning environment. *Higher Education Research & Development*, 44(1), 20–32.
<https://doi.org/10.1080/07294360.2024.2429446>
- Middleton, A. (2024). Twalks: walking, talking and tweeting. In: Garnham, W. & Operandi, P., eds (2024). *Outdoor learning in higher education: Educating beyond the seminar room*. London: Routledge.
- Middleton, A. (2018). *Reimagining spaces for learning in higher education*. Basingstoke: Palgrave Teaching & Learning.
- 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. (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/jmb.2011040103>.
- Middleton, A. (2009) 'Beyond podcasting: creative approaches to designing educational audio', *Research in Learning Technology*, vol. 17, no. 2, pp. 143_55.
- Middleton, A., Fraser, B., Elsegood, S., & Collenette, N. (2024). Chapter 4 - Spatial fluency. In: *Harnessing multimodality in higher education: Principles for new learning, teaching and assessment*. Toolkit, QAA. Online at: <https://www.qaa.ac.uk/membership/collaborative-enhancement-projects/learning-and-teaching/harnessing-multimodality-in-higher-education-principles-for-new-learning-teaching-and-assessment>
- Middleton, A. & Acevedo, B. (2023). Creating a playful conversational learning space using surrealism and podcasting. *The Journal of Play in Adulthood* 5(1), 1-19.
doi: <https://doi.org/10.5920/jpa.1272>
- Middleton, A. & Nortcliffe, A. (2010). Audio feedback design: principles and emerging practice. *International Journal of Continuing Engineering Education and Life-Long Learning*, 20 (2), 208-223.
- NCIHE [National Committee of Inquiry into Higher Education] (1997). *Higher education for a learning society*. London: HMSO.
- Nicol, D., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31, 199-218.
<http://dx.doi.org/10.1080/03075070600572090>
- Oldenburg, R. (1989). *The great good place: cafes, shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day*. New York: Paragon House.
- Orr, S. & Shreeve, A. (2018). *Art and design pedagogy in higher education: Knowledge, values and ambiguity in the creative curriculum*. London & New York: Routledge.

- Rodriguez, A. & Rodriguez, Y. (2015). Metaphors for today's leadership: VUCA world, millennial and "Cloud Leaders". *Journal of Management Development*, 34(7), 854-866.
<https://doi.org/10.1108/JMD-09-2013-0110>
- Ryan, R.M. & Deci, E.L. (2000). 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.
- Ryan, A. & Tilbury, D. (2013). *Flexible pedagogies: new pedagogical ideas*. York: Higher Education Academy. Online at: <https://www.advance-he.ac.uk/knowledge-hub/flexible-pedagogies-new-pedagogical-ideas>
- Sambell, K., McDowell, L., & Montgomery, C. (2013). *Assessment for learning in higher education*. London & New York: Routledge.
- Shreeve, A. & Batchelor, R. (2013). Designing relations in the studio: Ambiguity and uncertainty in one to one exchanges. *Design & Technology Education: An International Journal*, 17(3), 20 – 26.
- Shulman, L. (2005). *Signature pedagogies in the professions*. *Daedalus*, 134, 52 – 59.
- Small, A. & Schmutte, K. (2022). *Navigating ambiguity: creating opportunity in a world of unknowns*. Institute of Design at Stanford. CA & NY: 10 Speed Press.
- 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
- Tough, A. M. (1971). *The adults' learning projects: a fresh approach to theory and practice in adult education*. Toronto: OISE.
- Vaughan, S., Austerlitz, N., Blythman, M., Grove-White, A., Jones, B., Jones, C., Morgan, S., Orr, S. & Shreeve, A. (2008). Mind the gap: expectations, ambiguity and pedagogy within art and design higher education. In: Drew, Linda, (ed) *The Student Experience in Art and Design Higher Education: Drivers for Change*. Jill Rogers Associates Limited, Cambridge, pp. 125-148.