



Spatial Fluency

@ Anglia Ruskin University

Context: Anglia Ruskin University (ARU) is known for developing active and experiential approaches to learning in which employability is an outcome of authentic learning and assessment.

Spatial fluency, knowing how to successfully navigate and negotiate modalities and boundaries critically and confidently, is an essential postdigital skill and has emerged as a significant focus within ARU's ongoing commitment to developing staff and student digital fluency, and employability.

The application of digital skills underpins everything a person does in study, work, and life in a world where the digital is ubiquitous and pervasive. A focus on fluency situates learning as an outcome of a person's confident engagement in and across formal and life-wide opportunities and challenges (Barnett & Jackson, 2020). Teaching, learning and professional skills are affected by a person's ability to critically analyse the material and digital affordances that shape the situations we encounter each day. Being able to fluently interrogate spatial affordances is an essential skill and demonstrates how multimodality and spatial fluency intersect to multiply what is possible and useful.

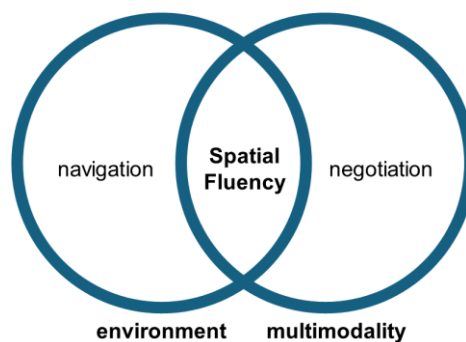


Fig. 1 Spatial fluency at the intersection of environment and multimodality

Our study, conducted as a collaboration between staff and student development teams, reflects the disrupted post-pandemic practices of staff and students in relation to multimodalities and the postdigital environment. Our aim has been to observe how people navigate and negotiate their disrupted spaces and the implications of this for future educational practice and employability.

Navigation – plotting and monitoring one’s progress; an outcome of decision-making; sometimes considered and sometimes in the moment.

Negotiation – analysing options; the ‘what, why, and how’s that inform an experience.

What we did

This study takes place in the long shadow of the COVID-19 pandemic of 2020-22 – an event experienced by everyone as one requiring an abrupt shift towards digital solutions. Whether working or learning, we shared a common experience of highly disrupted physical and social (dis)-locations. However, digital technologies and media provided everyone with a lifeline and in this locked out world it became no longer viable to be technologically agnostic. We understood **media, space, association, method, time, and values** differently, because we all experienced them differently.

The study did not set out to be a study of Working from Home [WFH], but respondents continually brought it up, being a significant dimension of their personal new normality. In this study, spatial fluency, and multimodalities more broadly, reflect the outcomes of that recent experience and its lasting effects. Our methods sought to enable people to review constraining and emancipating spatial affordances by reflecting on their experiences of university now. Our research questions were,

what strategies do our teachers and students deploy for successfully navigating their use of formal and non-formal physical, digital and connected spaces for learning?

and

what role do physical, digital, and connected spaces and places play in offering opportunities for teaching and learning?

We hypothesised that,

Having spatial fluency is empowering and enhances teacher and student agency, efficacy, and fosters our sense of belonging.

We interviewed staff in academic, development, and support roles (n.18) and students (n.8). Our staff represented the position of both teachers and workers in a disrupted world. Their individual stories reflect professional working life as much teaching identities *per se* and allow this study to consider implications for developing employability.

We used a mixed-mode approach in which each respondent was asked to identify a day on which to make a 'day log' – an outline diary recorded by the respondent to report their experiences as they occur over a single day. Respondents were also asked to make a small number of photographs or screengrabs to highlight what they perceived to be significant moments and places from that day. The Day in a Life diary method (Think Design, n.d.) and Photovoice approach (Brown, 2024; Gravett *et al.*, 2022) empowered respondents to surface many themes through interviews conducted online via MS Teams. With reference to diaries and photographs, the interviewer asked the respondents to talk about the situations they had recorded, including:

- What were you doing at this point?
- How were you feeling?
- Were you using digital technology as part of this activity?
- What else were you doing at this point?
- Who did you interact with? Why? Where? How?

The staff and student interviews were transcribed and thematically analysed using a framework structured around Strategies and Methods (8 dimensions), Spatial Affordances (8 dimensions), and Multimodalities (4 dimensions). The analysis involved generating a series of documents from the transcripts: Personal Stories (n.60), common Thematic Accounts (n.46), Tips (n.23), and Workshop Provocations (n.5). The writing of each story and theme document was an analytical process undertaken by the research team (4 staff and 2 student interns). Each document concluded with a statement setting out the implications for spatial fluency and for establishing effective multimodal environments.

Those statements provide the basis for the following sections which are loosely categorised using the themes of boundary crossing, modalities and affordances, and agency and identity. Participants are anonymised and roles (staff, student, etc) are only identified if their context is felt to be significant.

Spatial fluency and multimodalities: an assemblage

The following infographic shows how boundary crossing, agency, identity, modalities, and affordances form an assemblage of ideas which explain how spatial fluency and multimodalities intersect.



Spatial fluency emphasises **agency, creativity, resilience, and connectivity** through the lenses of **negotiation** and **navigation** in a postdigital world. This positions the student as the central actant in their learning and their life: learning involves **acting, embodying ideas, evaluating them, and forming graduate identities by co-operating and connecting** with others. (Middleton *et al.*, 2021)

This person-centred view allows the educator to appreciate the centrality of **contextual affordances** in their students' experience: the tangible and intangible drives, nudges, and values that shape and make sense of learning. These include the **spatial affordances** that create the volatile environment a person authors as they continuously cross boundaries. The act of **boundary crossing**, as a negotiation, is a particularly strong connector between multimodality and spatial fluency. It describes the iterative decision-making a person engages with in relation to **media, space, association, method, time, and values**. These factors come into play in learning, teaching and assessment and provide design parameters that reflect a person's agency within a volatile educational space. They lead to questions like: What modalities could work? Where might be best? How can media amplify experience? Who can help? How? And why?

Staff and Students Perspectives

As a qualitative study of staff and student experiences, the thematic analysis demonstrates how many themes are common to staff and students, albeit their individual contexts and stories are different. The following thematic sections, in which quotes are incorporated, reflect this. The following 3 themes are each presented as a series of related topics.

PHILOSOPHY: A focus on space reveals the centrality of the personally authored narrative in the lives of students, staff, and workers more generally. Confident and critical navigation and negotiation of material and digital space, tools, and media are dimensions that underpin these stories.

Theme 1. Boundary Crossing

Existing systems and structures can undermine fluency and connection-making.

Many of the accounts refer to disconnections, connections, and the crossing of boundaries. Experiences often refer to inherent conflicts with typical organisational structures and systems.

“The system [is] ...deeply atomised. [Students] are shuttled from one module to another with a concluding statement at the end of each module and no tying-on statement at the beginning ...It's no wonder that people go, ‘Right. Well, that's it. Level X done!’” [GB]

Examples of boundaries, and (dis)-connections raised by respondents include:

- digital-physical;
- work-home-study-life;
- pure knowledge and knowledge situated in the real-world;
- transition-in-through-out;
- feedback-reflection;
- formal-non-formal-informal;
- teaching-learning-assessment.

Other boundary spaces brought out in testimonies include ‘in-between times’ such as walking, travelling, and taking breaks. These are referred to as spaces that punctuate the day and accommodate reflecting on study, preparing for work, and maintaining other life responsibilities.

Reflections: Learning narratives are often partially obscured, ignored, and unwittingly devalued. Attention to a person’s connection-making across systems can help to promote self-direction and determination, acts of negotiation and metacognition, and the authoring of personal reflective and future narratives.

Learning how to manage boundaries

Home life, study life, and work life are not easily demarcated. People are often unaware of the boundaries that they easily and unintentionally cross or where a boundary requires negotiation. For example, managing ‘fire breaks’ – the need to introduce regular activities to prevent unrelated activities from running into each other.

“When I’m not working, that room is switched off ... [like campus,] I’m not in the office.” [KL]

DP’s staircase similarly acts as a switch. For him, it establishes a liminal boundary between work and non-work during the day.

Students often had smaller and shared spaces and felt constrained and invaded by the expectation of having their web cameras on. Keeping your camera off is a self-preservation strategy and academic KL discusses how he respects student privacy in class using interactive ‘hooks’ – multimodal moments when he invites contributions in an imaginative range of formats and channels, including through his personal phone rather than Teams.

Reflections: Fire breaks and switches are metaphorical devices that signal how people can take control of, and gain respite from, their technologies.

Learning how to transition between spaces

Several people talk about how they move between spaces – ‘in-between times’. This can be about the need to ‘zone out’ [SAc], not wasting precious time, staying healthy [JA, PP], as well as being stimulated by the changing environment [SA]. For JC (student), this about the importance of checking in with children in the space between campus and home,

When I was on the bus, I was a bit more relaxed. I was checking stuff. I felt on top of things. So, the digital media was making me feel good.

A change of place can equate to changes in attention and mode, whether that is the walking conversation, the shift from material world to podcast listening, or enjoying the immersive space to concentrate while on a train or bus journey. Such spaces are not voids, but spaces for self-direction, shifting focus, getting things done, rest, reorientation, or reflection.

Reflections: Because connectivity means we are ‘always on’, we need to learn about the value of in-between times: when, how and if we should reflect, switch our attention, exercise, or just rest.

EXPERIENCE: Individual experience in higher education is one of making and managing connections. People are present in multiple contexts throughout a day – sometimes simultaneously. Critically identifying and evaluating material and digital spatial affordances is a hidden postdigital skill that needs to be developed.

Being present in multiple contexts simultaneously

Respondents did not dwell on their boundary crossing behaviours and tended to accept them as matters of fact. Stories typically reflected multidimensional, polycontextual lives. This is evident in the multimodality of spaces and objects within reach of the respondents as they sit at their desks, as they travel between places, or as they look after others at home. It is evident in the relationships that people describe, and the strategies they use to maintain multiple responsibilities that span study, work, and life more generally. It is facilitated by the media people choose and the ubiquity of connected technologies. It is present in the multiplicity of intersecting lives that contribute to the richness of higher education and life more widely. It is not a synonym for multitasking, nor the merging of home, work or study life. Instead, it is best understood as a continuous splitting of attentions, and a criss-crossing and blurring of responsibilities and identities.

Polycontextuality means being present in multiple contexts at the same time, materially, psychologically, or socially. Engeström *et al.* (1995) describe it simply as “engagement in multiple ongoing tasks”.

It can be intentional and positive as a strategy for remaining present, connected, on top of things, and socially supported. But it can be negative too, with respondents feeling ambivalent about their inability to switch off or manage multiple and conflicting identities. Examples include,

- listening to email as a way to tune-in to the workday while tidying up the house [GB]
- alt-tabbing between the daily Wordle and the online work diary first thing each morning [BS]
- being in bed and doing work on the laptop [SH]
- checking work email while being responsible for childcare [SAc]
- keeping multiple browser tabs open because you want to keep them all in mind – but not “finishing everything perfectly” [SH]
- overhearing conversations when sharing a home office with your spouse [DP, JA, SH]
- organising personal and work ephemera on desks and ubiquitous digital devices [KL, EK, YJ, GA]

- having separate work and personal devices side-by-side [CN]
- being distracted by technologies and social media (see next section)

DP appreciates having his wife as a 'surrogate' co-worker at home,

"Sometimes hearing bits and pieces just becomes a springboard for a conversation about ways to handle things. And she'll talk sometimes about comparable situations where she works."

Polycontextuality is also found in sharing home space and using technologies. Co-working spouses is an area of potential conflict; one that has required negotiation. [TT] Competing conversations in online voice calls in shared office-bedrooms and open plans can be problematic. SH shared a photograph of her bed's headboard,

"Sometimes I run into this room if my husband is upstairs in the computer room... and if he's using Teams and all that. It's very difficult."

Digital technologies, furniture, and whole homes lose their provenance too. Technologies are ubiquitous, being owned by individuals or organisations. Whoever owns them, they tend to be used freely across domains, fusing work, study, and leisure. The learner, the worker, the friendship network, and the family may suggest clear boundaries but, in reality, these are crossed repeatedly with little awareness or consideration. Respondents indicate that the advantages of extended reach and staying in touch can obscure the risks of straying across boundaries, data insecurity, or digital exhaustion. Many respondents talk about buying equipment for work as part of the unspoken WfH deal. [BL, TT, JA, MA]

Reflections: People reported falling into polycontextual ways of being. To remain healthy, people and organisations may need to be more aware and assertive about how we delineate and manage our space and time.

Digital distraction and multitasking

The ubiquity of technology means that it becomes a constant presence – creating an augmented space that reaches across study, work, and home life. WF (a hard-working busy mum and student with a part-time job) captures this,

"You can do even more with digital platforms, but it definitely exhausts me."

Spending endless time in front of screens for study, work, leisure and pleasure is noted by many respondents as an incidental disadvantage of always being connected. This is something that students raised frequently, especially where access to personal technologies was limited. WF creates a picture of the unstoppable responsibilities and distractions of being 'always on',

"I can do my Ocado shopping. Or organise stuff with my friends online, like message them. But probably I do this when it's late... like 9 to 10. That's

when I wish I didn't really do so much online stuff. That's when I'm really zoning out."

She describes how she falls into 'doom scrolling' behaviours on social media.

"Why am I even doing this? I need to sleep. I don't know why I'm in this rabbit hole of looking at a friend's cousin's dress shop, or something ridiculous."

Like so many of us, she finds it hard to put her phone down. Technology is part of everything, everywhere. It helps us to get things done in work and study mode, and in leisure mode too. However, these modes become easily fused and our lives can be a matter of continually crossing contexts and identities, unwittingly tying ourselves in mental knots.

Reflections: We need to,

- remember to move and stretch and be physical at regular intervals throughout the day
- change perspectives by taking breaks, having walks, mixing in different types of activities
- socialise by being with and speaking to other people – even if these are friends, neighbours, people in public places. Scheduling in informal and unfocused get-togethers with peers is important for all of us.

As educators, we can think about designing multimodal assignments that give students variety and choice. Project-based assignments, for example, can be used where, typically, projects are well-structured and embody a mix of independent and collaborative phases.

Theme 2. Agency and Identity

PRACTICE: Productivity and maintaining a sense of belonging are often in conflict. The purpose and priorities of study and work need to be recalibrated. The value of really being together may need to be accommodated in new ways.

Being over-productive

"There's no dead time ...there's always a useful time." [GB]

"I do feel that there's sometimes an expectation that we need to get more things done because we're online." [LD]

“I’m like back-to-back, you know. I’m literally jumping from one meeting to another. So even if I have a small slot, I’m squeezing in another student tutorial or I’m looking at emails.” [SH]

Being productive is another recurring theme for staff and students in which the digital and the physical seamlessly combine as a carefully orchestrated space, often in justification of reduced physical presence.

Productivity crosses formalities. Many respondents discuss how they manage domestic arrangements by interweaving them with work or study throughout the day. Demarcating time as ‘non-thinking space’ and incorporating mini ‘digital detox’ breaks are given as examples of personal strategies that, pre-COVID, would have hardly been considered but which now feel essential. People describe long compressed working days to free up time later, taking a nap in the afternoon, or habitually prioritising exercise during the day, for example. Mostly, people are still coming to terms with how to structure their days, expressing uncertainty, and frustration with themselves and their need to avoid doom-scrolling, or to create ‘fire break’ strategies to contain their relentless productivity.

Staff respondents also note that being online and available all the time can model unhealthy behaviours to students. For students, being online can increase access to participation, but it can also establish unsustainable and unreasonable expectations of each other.

Many staff respondents appreciated the loss of the commute, at least for some of the week. Like PP, there is a realisation that, “I can’t spend hours a day commuting.” Others make similar remarks about reducing personal transport and pollution [DP]. Staff note the time gained has made them more productive and more available in the non-work context. Now we have tasted and proven our ability to work off campus, the pre-pandemic paradigm seems absurd to some. Experienced academic TT says,

“I don’t want to go back to the day where we have to sit in the office for the sake of sitting in the office. So, I think there has to be purpose and meaning in those ...encounters.”

Reflections: The past may look absurd, but the present feels unbalanced and uncertain. We need to check the demand we place on ourselves and others and develop strategies for building in breaks. Multimodal design can help to develop people’s ability to negotiate balanced approaches to work that allow for the non-formal in-between times and activities that are as much social as productive and which are critical to health, reflection, and refocusing our energies.

Learning to create structure within the ‘chaos’

Students OG, WS and WF observe how they establish structure within their day (study, work, home, leisure) and this helps them to counter a sense of ‘chaos’ that comes from mixing their formal and informal learning, their constant physical-virtual interplay, and their temptation to address their daily complexities by multitasking. Being organised helps them to

maintain momentum. They also note that structures are short-lived and need to be reviewed and renegotiated continuously.

SA [academic] notes how, due to the diversity of student life contexts, learning how to develop and maintain study and work habits is, by necessity, a personal skill that requires support. MA develops this,

“One of the interesting things about recent times is that it's allowed each of us to create a normal a way of being, a way of working, a way of studying.”

Reflections: Opportunities for reflecting on study and work habits need to be positively designed into the student experience to develop healthy learning strategies and employability.

The depersonalisation of higher education

Respondents refer to the loss of interpersonal experiences as an inevitable outcome of the ubiquity and pervasion of digital technologies and media in all that we do.

Although he remains positive about automating the mundane, JA warns of an emerging dystopia. He describes his experience of going to the gym and how everything is done through his phone apps. His real point is about directions in higher education,

“You walk up, you scan your QR code, you go to your own locker, lock it, and then you swim, come out. The doors are automatic. You could literally go through and not have any interactions with anyone. Then you come home and you work from home.”

BS shares her dilemma of whether to call a team meeting in person or online. She concludes expedience and productivity beat less tangible values.

Reflections: A focus on digital expedience undermines our need and desire to connect with others and to humanise experiences. We should not lose sight of how people feed off each other's energy and the value of investing in situations where being together is itself revelatory and rewarding.

Postdigital alienation in higher education

Many respondents expressed a shared sense of spatial dissonance; a loss of spatial meaning. Teaching through MS Teams can involve talking to a sea of circles containing outdated photos of students who prefer, for various reasons, to not switch on their cameras.

“Back in the day ...the people you needed were there right in front of you. Something about the world today is more uncertain.” [MA]

WFH was usually referred to as a transitional new normality requiring continuous renegotiation. This is captured in reflective comments like,

“I felt alienated when I opened the door...” [no sign of anyone] and “this is how life is - talking into that laptop on my own.” [MA]

Both WFH and pervasive technologies have broken down the previously well-defined spaces and identities of home and work.

“[They] are at times competing for my attention” [TM]

When working compressed hours, SAc is concerned about ‘being out of sync’ and describes how, “I might just scroll through my phone and see if there are any important emails that have come in.” JA talks about having lost his sense of home as it has become a workplace. Other staff are unable to switch off, due to the relentless stream of Teams Chat messages, e-mails and notifications.

“We’re still looking around to understand what normal can be... there need to be many normals.” [MA]

As efficient as it is, the digital space cannot fully replace the material space and satisfy our expectations for having a meaningful sense of place.

“I’ll get to see you on Thursday... We get to talk. It will be different when we see each other on Thursday.” [BL]

Reflections: Uncertainty and a sense of dislocation are realities which need to be countered. For students, experiences centred on co-creation and peer supported learning can foster a sense of belonging, and shared identities and repertoires.

Imposters developing autonomy

New ways of being, and the ability to negotiate novel modalities, require confidence and trust. Many staff and student respondents describe their need to prove themselves to gain trust. They report a sense of imposter syndrome amplified by not being amongst their peers, as would have been more typical pre-pandemic. This is captured by TT, an experienced academic,

“It does create anxieties in me. ...I will occupy my time in what I consider is a good way. But there is always that anxiety at the back of my mind about my worth.”

Reflections: For less experienced staff, and for students who will graduate into organisations where parameters are more fluid and where professionalism is more defined in terms of agency and agility, people need supportive opportunities to develop their professional identities and attributes. Spatially, this can be achieved by critically interrogating and innovating in the postdigital multimodal landscape.

Accommodating flexibility, autonomy, and innovation

Working practices have changed since the pandemic with a significant shift away from co-location. Living, learning, teaching, and working have to be negotiated individually, and new preferences defended. Respondents indicated how most people value being with their peers, but not all the time.

The pandemic unleashed the potential for more flexibility, autonomy, and innovation. People experienced technologies and discovered how they can support new ways of being. They report having learnt more about what they prefer and how to still be productive. However, each person has a different take on the new realities.

KL lives about 80 miles away from campus - a significant daily commute. He says, as a Director of Studies, it is more convenient to be at home. Working in the new open plan agile working environment is problematic as he has frequent sensitive conversations with students, who also prefer it because they can be more at ease. His line manager has, “no issue with me getting everything done.”

LD notes that “in my previous role ...we were really forced to come in. WFH was like a ‘no, no’.” Her whole team works from home now. Even so, she likes to go onto campus although workplaces can be surprisingly empty. She also notes,

“Even if we do go in, we end up in [online] calls often because it’s a lot of collaboration ...There is something lost, I think. I do feel like I am missing what I used to have before.” [LD]

LD, PP and KL describe a shift from a culture of highly regulated practices. PP says, “They are actually in the process of taking away all the offices in our faculty anyway. I know that... they’re more than happy with what I do.”

Some discuss a loss of intimacy that is not easily replaced by the digital meeting places they use, and a loss of social activities such as ‘team bake sales’ [LD] that were social in nature, even when their stated intent was to be charitable. While the old idea of work had a social purpose, it seems many are only appreciating that now that it has largely gone.

BL is a keen advocate of being on campus with others, however, the reduction in physical space since the pandemic has led to greater agile working arrangements. Consequently, BL cannot guarantee getting the height adjustable desk she needs. This has created a barrier for her, whereas she has personally invested considerably in developing her home working space, physically and technologically. Similarly, others, such as TT, discussed how they have invested in their work by building garden home offices and making over spare bedrooms to accommodate home working. [JA, DP]

Staff and students talk about how they have optimised their spaces according to their situation. Until TT had built her home office in the garden, she said she was ‘squatting’, working from the conservatory or dining room table.

*"I never felt away from work. It was because I couldn't put my books away.
I couldn't put my computers away."*

DP says,

*"I managed to squeeze a desk in and find a place that is comfortable.
Good lighting. Well-heated ...and I get decent enough connection."*

SAC and BL both talked about how meeting new colleagues in face-to-face situations is a reminder of the valued intimacy that people have lost from their daily working lives.

*"Even though I've spent a lot of time on the other end of the screen with
her, being in a physical space together with her changed us." [BL]*

SH compares supporting her students online with being on campus. Sharing a Teams screen is often not satisfactory. On campus she can,

*"...physically show them. 'This is what you do.' And it always helps,
especially as I deal quite a lot with international students."*

SAC also talks about how physical spatial affordances can be empowering. The constraints and unfamiliarity of physical spaces necessitate a special kind of academic resourcefulness and fluency.

*"You adapt to the environment ...I was prepared with my sticky Post-it
Notes and some paper and some, you know, whiteboard markers."*

Fellow academic, JD, talks about his 'closeness' to a building and how the built environment importantly connects us with "the future and the present, but also with the past."

In contrast, JK is pleasantly surprised at how her preference for working face-to-face has changed. She enjoyed the office environment and its *ad hoc* conversations around the photocopier but, she says,

*"I actually now prefer working remotely. I feel that I work more efficiently,
and I feel that I am better able to ask questions of colleagues."*

SH says she goes to campus, "just for a different sort of an environment if I find that I've just been in the house for few days."

Reflections: Students are graduating into this changing workplace where the ground rules remain in flux and where working life is a matter for continuous negotiation. Being able to reflect on and negotiate working habits are new professional skills that can be developed while at university.

Agile approaches can dehumanise work and can exclude people when they focus solely on logistics. People want to be face-to-face sometimes. Working environments need to be reconfigured so that they respond to people's desire to socialise as workers. Team project-working and co-design events may help.

Fluency for life

BL discussed the importance of being able to maintain our critical awareness of digital technologies and media throughout life and into retirement. Relinquishing these abilities is tantamount to giving up on life in the postdigital age. She has been worried for her own parents who haven't had the education she has had. Her own digital identity has been self-defining and now that she is approaching retirement, she does not want to lose her sense of digital empowerment.

Reflections: Spatial fluency is a life-affirming matter and one that requires the development of self-maintenance skills and habits.

Theme 3. Modalities and Affordances

Developing environmental awareness

Having spatial fluency is having a critical awareness of the environment, and managing your sense of being and your agency in relation to it. In terms of multimodality, this includes being aware of technological affordances and how they suit your preferences and efficacy for interacting with the world. For example, listening to email, rather than reading it, is noted by one respondent as a way for managing her feelings of being overwhelmed.

Reflections: Opportunities for students to negotiate assessments and to try out alternative media can support them to think critically about knowledge, its application, and the affordances of different media.

Being ready for relentless change

Respondents referred to the emergence of AI and how we are again acclimatising ourselves to new realities, risks, possibilities, and desirable practises. AI amplifies the volatility and uncertainties of the postdigital world. It requires organisations to review their approach to agility and their dependence on inflexible standards. Assessment methods, for example, are a site for innovation.

Reflections: Individually, as organisations, and as professional bodies, it is more important than ever that we are critical, creative, and agile. The role for active and authentic pedagogies, such as problem, scenario, and simulation-based learning, can help to foster future-ready graduate capabilities.

Better tools need better communication skills

While MS Teams and Zoom were largely unfamiliar tools prior to the pandemic, respondents now regard them as 'everyday' environments. They have extended the range of channels we use and monitor each day.

LD believes people have developed better communication methods and skills. Certainly, there are more options for communicating and for collaboration, however, others observe how inconsistent they are in their use of communication tools. Individual awareness of alternative channels, their skills, preferences, and confidence come into play.

Further, there is a huge variation in the quantity and quality of messages people send and receive, depending on their roles. Not being in tune with team members can lead to confusion and isolation. For some people, using chat tools at work has replaced email, but this is not so for everyone. Etiquette for backchannel chatting is also noted as being under-developed.

This shift in methods and protocols affects spatial practices holistically. BS describes how she is still "weighing up when to use email rather than phoning people."

"If [a student] has a quick question, it's fine. They can email me at midnight, and I can answer them ... Sometimes we want to have a meeting [so they can] ask me a particular question about their dissertation or something ... But that would very likely still be digital, probably be on Teams."

BS also describes the dilemma of where to meet her Programme team, for example to agree their collective position on AI. "It would be really inefficient [for 5 people] to have to travel 3 hours to have a one-hour meeting." Meeting arrangements tend to be pragmatic.

Individuals are settling into new post-pandemic norms, personalised to accommodate their work, study, and life responsibilities. People report how arrangements for teamworking need to be carefully negotiated. Often, home and caring responsibilities can be accommodated more easily with the WFH shift; however, the need for infrequent and irregular in-person meetings can cause tensions and be difficult to negotiate.

The importance of talking about how to collaborate and communicate requires new levels of sensitivity and clarity. People have already made lasting adjustments to their home-study-work arrangements, which means old ways cannot be easily reinstated. Expectations and assumptions need to be checked to avoid excluding peers.

New channels and divergent habits have extended inconsistencies in our digital practices. How we write, how we listen, what is professional, what is informal, and what we expect of each other result in a cacophony of uncertainty and stress amongst our respondents. What was once paper, became email, but is now chat. What was once written is now spoken or performed. What was once retrievable is now ephemeral. Formality has lost its edge and non-formality exists as a productive in-between state that connects work, study, leisure, and home.

Reflections: Collaborators (i.e. work teams, student peers) should spend time discussing their interdependencies to agree what works, where, and how. Collaborative working is a graduate skill and something that needs to be developed based upon new practices. This means people need to learn and develop the confidence to negotiate how they engage with work and study.

Multimodal segue working and learning

Locating work and study can be less about geographical location and more about the flexibility afforded by digital tools and media.

The cut and thrust of the commute have reduced for many people. Respondents explain how they now blend into their daily work and study commitments. Like SH, BS notes, “I tend to do things in bed on my laptop.”

Taking a screen break by going for a mid-day walk, for example, has become important to many [LD, JA]. Having a mental break from work by doing “a bit of Duolingo” or other “little things” is a strategy some people use too. [BS] Watering house plants or looking after the garden provides an immediate digital detox for others. [DP]

Reflections: Study tutors and line managers need to be proactive in discussing personal strategies for setting aside digital devices. Without this attention, mental well-being is at risk.

Multimodality in material space

Spatial affordances are those factors associated with a situation that influence behaviours. They can be subtle, invisible, inviting, affective, cultural, and unintentional qualities of both material and digital spaces and tools. Or they can be more functional and intentional in nature.

As a neurodivergent person, GB highlights how white cube spaces that are apparently devoid of distractions can be particularly difficult because there is, “nothing in the room for me to lock onto.” She also notes how acoustics and background noises can be easily overlooked in spatial design. She has developed coping strategies like assembling a collection of objects to keep her calm.

KL works long days from his desk at home where everything is within reach. It is a multisensory space in which work and life mix, as represented by an array of family photos and memorabilia, along with work materials and technologies. Adjacent to this he has got a big picture window which looks out onto countryside. He sees farm vehicles, horse riders, and his neighbour’s nine-year-old going past.

Reflections: In the postdigital age, multimodality is an holistic design consideration. Physical and digital spaces can be inspiring, but ultimately they need to properly accommodate diverse people who are affected in different ways by the spaces they share.

Multimodality and spatial fluency can be harnessed to provide individuals with options. Involving neurodiverse people in spatial design can help.

The multimodality of visceral spaces

KL comments that he can only see part of me in our Teams meeting. But, he says, “70% of communication is body language.”

He also mentions the loss of paralinguistics in online interaction - the ways in which people show what they mean through their tone of voice, by making other aural sounds, or by incorporating hesitation markers, for example.

BL also discusses the visceral experience of being with colleagues. “It’s wonderful. We get to talk,” she says.

Spatial affordances are evident in discussions about the equivalence of physical and digital spaces, and the extent to which physical experiences can be replicated in digital spaces. JA joined the University during the pandemic. He did not meet his colleagues in-person for quite a while.

“It did change after I had met them physically. They became 3-dimensional. They had different mannerisms. The body language you pick up that the flat screen just doesn’t... you know, you get gestures. It’s very different.”

He says he values, “the water cooler moments more when you’re in person”, but he also observes, notes get made and actions taken when you meet in Teams.

Reflections: Spatial fluency means understanding the different affordances of spaces and what it means to be with people to get the most out of each situation. Multimodality is dependent upon an individual’s ability to critically evaluate the affordances of different spaces.

Digital media representation

While digital information can be convincing, it needs to be interrogated. More than fact checking, the veracity of a scene represented in a photograph or video demands close attention. Media cannot be taken at face value, however. A photograph of the Himalayas serves to remind one respondent [GA, academic] of the field trip she led. However, it failed to communicate the splendour of the scene and the moment. While digital media can extend the ways we engage, we must be cautious about the extent to which we rely upon them and how they might be interpreted.

Reflections: Developing digital critical literacies should be part of a multimodal education.

Digital risk and uncertainty

The digital space is inherently risky and threatens to thwart you.

“...the uncertainty is that you feel like it's going to break every day.” [SAC]

Digital technologies can be unforgiving when connections or devices fail. They can also erode the boundaries that have helped people to manage their work-life balance for so long. While this is felt to be inevitable by many, when everything is disrupted, up-in-the-air, or emergent, there can be a pervasive sense of unease and anxiety.

Reflections: Digital and material spaces can be used to complement each other. Too much dependence on digital technologies can be unsettling. Being in the same place as other people can be reassuring and can help people to develop confidence and resilience.

Desks and technologies

Respondents often chose to share photographs of their desk, all of which reveal the personal nature of work and study, reflecting the unique and multiple spatial modalities of their owners. Their desks are arrangements of laptops, books, Post-It Notes, mascots, mementos, mugs, coasters, water bottles, digital devices, analogue devices, large and small screens, headsets, keyboards, lamps, stationery, spectacles, packets of crisps, empty bowls, phone chargers, COVID masks, note pads, lanyards, and much more.

Some desks have views, while others have none. Some desks are dining room tables, while others are simply ledges. Some desks are very tidy, and others appear chaotic. Some are shared with children and partners who may leave their things out. Some are surrounded by musical instruments, exercise equipment, and spare bedroom paraphernalia.

The desks reflect the attitudes of their owners, their sense autonomy, order and routine.

Student YJ shared photos from the start of the day and again from the end.

“I have my laptop and then I have my pad and paper there in case I want to write. But then I also have my water bottle and everything. It's almost like routine for me.”

YJ described a long day, with associated rituals, of completing a final year assignment. The desk became a site of engagement with everything in its proper place.

JC (student) described how she constructs a study space at home out of cushions, connecting her laptop to the big TV screen that her children and partner use for playing games. She says,

“That is a kind of spatial thing where I need to have ...little rituals. I've got a scented candle. I've got a little fan in there in case I need it, and I've got some joss sticks. And I've got a big fluffy light fitting. It's huge with kind of like feathers all in it. So, I tried to make that space as soft as possible in order to help me focus and work better to get that sense of deep work.”

Reflections: In their different ways, desks become portals to study and work. They are indicative of the personal rituals people devise to support their transition from one state into a self-devised formality. Using photographs to talk about desks or study spaces with student groups may help to elicit useful ideas about alternative study practices.

Misrepresenting modalities

JA observes how the formal digital learning environment struggles to reflect the world our students know and recognise. An email symbol will typically use an icon showing an envelope and a video may be indicated by an icon showing an old film camera or analogue film. “Films aren't even shot on film stock really as much anymore.”

Reflections: People's experience of media, in general, may be different. We should encourage people to be creative in how they think about it and use it.

Digital photographs, drawings, and objects as learning stimuli

Photo elicitation has been used within the photovoice methodology that underpins this study. We asked people to capture significant places and then to select one or two of their photographs. It is remarkable how the use of respondent-generated photographs quickly and effectively opened rich seams of discussion and analysis. Respondents did not comment on the technicality of the method; apparently it was straightforward. As a learning activity, the same approach can be used to orientate thinking, capture significant moments and details, and scope problems and contexts.

GA described how a photograph of a sign, which she snapped on a mobile phone during a field trip to an Indian antenatal clinic stirred her students into discussion about cultural differences. “It was a really memorable bit of learning for the group that we had there.”

MA uses ‘ugly drawing’ activities in which students speedily visualise their thinking and then make presentations using their peer's ‘artworks’. He says, “It is fun and unthreatening and a good way to explore perceptions and misconceptions.”

Handling objects, such as SA's skulls (see below) can also stimulate discussion, and when those objects are 'tools of the trade' they can help to develop professional identity.

Reflections: Multimodal designs, incorporating digital media, can create rich opportunities for personalising learning experiences, and stimulate engagement and deep thinking.

The promise of video

TT discusses how, as an academic in Nursing, she turned to creating video-based simulations in the COVID-19 lockdown as a way to replace the student placement experience; a signature pedagogy within the discipline. Sanctioned by the PSRB at the time, TT is keen to maintain and develop the course's use of video, including 360-degree video

simulations. Video is perfect for capturing the detail and nuances of the settings she has in mind.

“But I’m a nurse, not a technologist, so what can I actually use to do that?”

SA is a Zoologist and a “fairly avid adopter of new technologies and new teaching styles.” He uses object-based learning in the lab. Prior to lockdown his students handled the skulls of the species they were studying, but when lockdown struck, he turned to video to reproduce the objects.

“I recreated all of my labs digitally using 3D rotatable digital models hosted in Sketch Fab as well as dashing into [university] and basically filming myself going through how I would with all of the students.”

He says that a student who learns via team-based learning using a flipped learning approach is “undoubtedly better prepared when it comes to assessment because they’ve engaged actively with the materials as they go along.” He also notes, however, some students object to having to engage with the materials outside of class.

Reflections: Moving outside of traditional academic modalities can be hard work, but highly rewarding nonetheless when everything comes together. Multimodality itself has to be negotiated with students and with the university.

The promise of simulation

Several respondents have been developing simulation-based learning strategies. Simulation-based learning (S-BL) demonstrates how space and time can work together to increase student agency over their learning. Learning can be designed as a series of decisions to be taken by the student based on knowledge the student already possesses or knowledge developed as an outcome of spatial interrogation and problem-solving. In some cases, the latter may involve learning through safe failure.

DP explains how S-BL is often about,

“...Launching narratives where students get another chance to have a try at things and then maybe, as they move forward, they get a little bit more advanced and start dialling back the explicit instructional aspects of a scenario.”

S-BL epitomises the power of spatial affordances. The introduction of material or digital props can either direct a scenario or simply add nuance to it. DP says, “a student should be able to critically connect those dots.” S-BL is often open-ended and devoid of guidance, being fundamentally a spatial problem in which “the learning challenge is for the student to discern and pull together a meaningful structure or narrative.” Notably, it is usually sandwiched by briefing and debriefing phases that may take place in other spaces.

Reflections: Learning design is often an abstraction of authentic life beyond the classroom. While facilities managers are interested in generalising learning spaces by nullifying spatial affordances, teachers and their students can exploit the classroom setting, whatever it might be, reimagining and reorganising it for greater interactivity.

Material spaces are usually timetabled by non-academics. Specifying and negotiating spatial requirements can lead to different experiences and outcomes. Using a pattern and variety of spaces may better reflect the pedagogic intent and plan.

Routes to Multimodal Practice: **Spatial fluency**

In this focus on spatial fluency, multimodality creates a response to the postdigital world. Frequently, our attention moves away from digital mediation and towards the implications of digital integration: connectivity and context, new spatial affordances, new negotiated formalities, and new identities and behaviours. Educational design is essentially reductionist. (Smith & Kennett, 2017) Multimodality challenges this, being essentially holistic and best conceived as an ecosystem of strategies. (Cope & Kalantis, 2017) Similarly, the concept of spatial fluency views learning holistically: it recognises that the spatial affordances that affect learner experience and identity are life-wide in scope. They span and connect the formal, non-formal, and informal modalities of learners and the professionals they will become.



Listen to [Episode 1 – Spatial Fluency](#). A conversation with Rosie Jones, an expert in learning space design who shares her student and library services perspective.



A holistic reconsideration of the world that education creates for itself is required. There are implications for teachers and students, but there are also implications for facilities managers, IT departments, student support and development services, human resources departments, and others. By looking at the staff experience in this study, we also see how the world of professional work has changed and the implications, therefore, for employability.

INNOVATION: Material and digital spaces are experienced holistically. The development of spatial fluency and adoption of multimodalities require organisational joined-up thinking. To embrace innovation, universities need to work across services to review strategies.

Drawing upon the insights gained from the staff and student perspectives presented in this chapter, as reflected in the implications sections above, the following strategies are suggested as a means of optimising multimodality and spatially fluent learning across different practice settings:

1. **Confident multimodal strategies are needed** – staff and students, and professionals in general, have in recent times had to develop personal multimodal work and study strategies. Individuals have learnt to reconfigure their working and study lives to mesh with life-wide responsibilities and interests. Personal and institutionally provided digital technologies and media and adaptation of home spaces have enabled this. Novel practices have emerged. **Individuals and organisations need to positively embrace and optimise change, and recognise its continued volatility. This requires holistic reviews of expectations and standards, and investigations into how spatial arrangements inhibit creative attitudes. Working with employers and professional bodies may be mutually beneficial in achieving this.**
2. The infrastructure that underpins higher education teaching and learning today is better understood as an ecosystem of connected material and digital spaces. The study and work environment is made up of formal provided facilities interwoven with personal spaces and tools. It is a complex space constructed and navigated by individuals according to their continually changing needs and desires. Organisations need to embrace space as a postdigital matter, meaning that **holistic strategies that integrate the material and digital estate are needed**. Employees and students need to be supported so that they navigate and negotiate their spaces effectively. Stories from this study or elicited from within communities can support such development.
3. The development and maintenance of critical digital skills and literacies are needed, but more than this, a person needs to be able to assess and review the affordances of the spaces, technologies, and media available to them holistically. **Staff and student development, reflecting diverse experiences and futures, is needed to prioritise and foster spatial fluency.**

4. Staff and students observe a tension that exists between the personal and social experiences of higher education, and of work in general. People value being together in person, knowing that energies and having a sense of presence are heightened, and that professional and study identities are validated. However, many people observe that this social value and their desire to belong is not enough to bring them together if coming together means being pulled away from their productive work or if being together on campus feels unsatisfactory when others are absent. **Ways to create communal in-person opportunities need more attention.**

Co-design and co-creation events can provide staff and students with good reason for getting together in-person. Strategy development, problem-solving, ideation and evaluation activities, project-focused teams, and events that connect communities, including conferences and retreats, are likely to motivate participation by being both meaningful and engaging. Such activities can also build the communal resilience needed to sustain greater online relationships and replace the deficit discourses of presenteeism.

5. **Allow time for future-gazing and for future-casting emergent professional practices.** People are practiced in making decisions, being authors of their multimodal narratives. Being able to anticipate and plan for change and diversity in practice is part of an essential spatial fluency skill. The long shadow of the pandemic sees changes in professional behaviours, including an appreciation of, and dependence on, digital tools and media. These changes anticipate a constant state of volatility and uncertainty in many professional areas. **Our students are graduating into professional arena that will remain in flux. They will need to be skilful, agile and confident in negotiating and navigating their professional lives in ways that are compatible with their life-wide responsibilities and interests.** Personal and Professional Development Planning, the use of case studies that reflect new ways of working, and scenario-based learning can all signal the value of narrative and reflection in learning. Such narratives can be amplified through the integration technology and media-rich multimodal experiences. Student involvement in future-casting by using multimodal research methods can help shape a student's identity development and self-efficacy. (Bouchey *et al.*, 2021) The literature on multimodal education has so far dealt with the implications of digital technologies and media for the curriculum and co-curriculum experience. Future-gazing and life-wide scoping can help individuals to project personal narratives.

Spatial fluency and multimodality provide education with a space for examining “the links between knowledge and student being and becoming.” (Barnett, 2009)

Multimodal design is disruptive in its outlook. Spatial configuration, teacher-learner relationships, the textual representations of knowledge produced by teachers and students, and the way learning is evaluated, need to be updated to reflect life's volatility and diversity.

This study demonstrates that having spatial fluency is empowering and enhances teacher and student agency, efficacy, and can foster a sense of belonging.

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