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Research article

New terroirs: lessons from Hong Kong for seamless digital and physical interactions

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Abstract

Many professions have struggled to translate their disciplines into a flexible blended learning experience that is adaptive to the recent pandemic constraints and responsive to the changing needs of learners, and which can match the vibrancy of a purely physical place of education. Architecture has been counter-intuitively resistant to a more seamless, adaptive and responsive environment as a digital learning space. This is due to an ambiguity of the tools and elements available to practitioners for positive learning environments that can be usefully transposed to blended learning. For an industry marked as creative, since the mid-2000s it has found itself behind that of service designs' educational development. Traditionalists in our discipline have continued to focus on the production and craft of artefacts in design over and above process. However, we have sought to balance this craft and process with the appropriate digital 'places' and 'positions' as an emerging 'place-free' praxis for education. We collectively refer to all of these as a 'terroir' for new places and alternative positions in education. In this

article, we set out the ingredients and tools uncovered to deliver these progressive learning places within the new terroir, which are applicable to any creative industry. We also outline how to successfully promote agency within the learning process to foster creative education in a variety of design fields and assist in developing alternative school positions. The article explores the role that 'Process-to-strategy' has in facilitating creativity, while the 'Construct-a-journey' section describes the tools that are needed to enable students to fashion an autonomous learning path as a unified experience. Lastly, the 'Experience-the-terroir' section evaluates the inherent design possibilities in virtual environments across all themes and strategies to explore specific qualities of experience, which could lead to a greater understanding of the place containing design creativity, spatial illusion and design processes. The specific project that we discuss investigated the qualitative impacts of novel technologies adapted to the practice of architectural education along these four key themes. They are supportive to a peer-led, positive learning, transnational environment as a 'place-free' praxis, while providing a structured approach for reflexive educational design in a particular time of flux such as the recent pandemic. The article concludes with a summary of the new architectural terroir.

Keywords architecture; virtual reality; immersive; environments; exhibition; models; digital; collaborations; education; international

Introduction

Many professions have struggled to translate their disciplines into a flexible blended learning experience that is adaptive to the recent pandemic constraints and responsive to the changing needs of learners to match the vibrancy of a purely physical place of education. International architectural programmes specifically not only require positive learning environments that foster creative education in a variety of design fields, but also distinctive architectural school 'positions' that relate to pedagogical approaches (in this instance, design strategies), and schools of thought (as design themes), generated by both staff and students. It has therefore not been immediately apparent how architectural education could digitally harness the potential of this 'position and place' in a shifting pandemic landscape and, more widely, how such architectural lessons in terms of seamless digital and physical interactions could support the wider discipline moving forward.

Furthermore, architecture has been particularly, and perhaps counter-intuitively, resistant to transforming into a more seamless, adaptive and responsive immersive environment as a digital learning space. This is due to an ambiguity of the tools and elements available to practitioners for positive learning environments that can be usefully transposed to blended learning. For an industry marked as creative, since the mid-2000s it has found itself behind service designs' educational development, which unifies interactions between digital and physical experiences and focuses on the design process as an alternative position and new place. Traditionalists in our discipline have continued to focus on the production and craft of artefacts in design over and above process. However, we have sought to balance this craft and process with the appropriate digital 'places' and 'positions' as an emerging 'place-free' praxis for education.

Design themes such as the current role of design in addressing a climate emergency and the need to develop ethical practice for social value, together with how the health and well-being of users can be enhanced through design, are current topics that span multiple professional domains but have in fact been recurring in architectural schools' 'positions' for a prolonged period. They sit alongside our own design strategies, which are process themes relating to online education, of how to develop design strategies from online processes, constructing digital journeys, experiencing digital and physical studios and acting and engaging in those digital places. We collectively refer to all of these themes, design strategies and the location of this learning as a 'terroir' for new places and alternative positions in education.

Within the existing, pre-COVID *terroir*, specific but implicit design strategies – and how to address such themes appropriately – have been present within our profession for many decades, if not longer. However, these have not always been made explicit or codified. They have relied heavily on the culture and *habitus* of the studio, the teachers and students. At times these have lacked visible promotion and explanation of the process and design strategies, alongside their usefulness in wider design conversations, public engagement and understanding. That being said, such themes and strategies within architecture have actually been co-opted and developed further by a multitude of professions, coming from the digital into the physical realm of education and design. Professions that have been more successful in codifying and promoting these strategies within a wider public engagement strategy, and also in the present pandemic world, have adapted more easily to the shift online.

More recently, however, the Grenfell-Baines Institute of Architecture working in partnership with Vocational Training Council Hong Kong (GBIA–HK) have responded to both the civil disturbances and global pandemic health issues in developing and codifying more resilient, adaptive and interesting digital learning environments to provide continuity and minimal disruption for our students and staff. Since 2020, GBIA–HK has adopted novel design and process strategies to enable more blended online learning provision for the BSc (Hons) Architecture part-time validated course. While other courses operating online have focused on transactional strategies, we instead developed specific design strategies with tools to enhance the virtual and physical learning environment as a ‘place-free’ praxis. In so doing, we have strengthened our academic position, while exploring the current themes outlined above with a specific focus on material experimentation, experience-based design development and studies in the typological form in architecture.

Various aspects of our experience within the programme have provided fertile ground for examining and testing four key themes as part of the school’s position for a place-free praxis for education. The themes include ‘Act-in-field’, ‘Process-to-strategy’, ‘Construct-a-journey’ and ‘Experience-the-terroir’, which provide seamless interactions between physical and digital learning environments, utilising specific software course design strategies.

Students explored these themes and environments through GBIA–HK’s thinking, making and experiencing of architecture design strategy, generated from a complex set of dialogues between peers and staff, achieving deep learning across continents with different time zones and cultures. The collective experiences generated have been refined through the laboratory of experimentation using existing and novel software technologies to facilitate ‘digital studios’ with augmented ‘digital exhibitions’ to form an emergent environment and ‘place’ for education with a unique school position.

In this article we set out the components and tools to deliver many progressive online and virtual learning environments applicable to any creative industry. We demonstrate how to successfully promote ‘agency’ within the learning cycle to foster a creative education in a wide variety of design fields to develop alternative school positions. Ultimately, the specific project investigated the qualitative impacts of novel technologies adapted to the practice of architectural education along these four key themes; they are supportive of a peer-led, positive learning, transnational environment as a place-free praxis, while providing a structured approach for reflexive educational design in a particular time of flux.

The first section focuses on the ‘Act-in-field’ and its impact on students’ conceptual thinking. The following section reveals the role that ‘Process-to-strategy’ has in facilitating creativity, while the ‘Construct-a-journey’ section describes the tools needed to enable students to construct an autonomous learning path as a unified experience. The final section, ‘Experience-the-terroir’, evaluates the inherent design possibility in virtual environments across all themes and strategies to explore specific qualities of experience, which could lead to a greater understanding of the place of design creativity, spatial illusion and design processes. The article concludes with a summary of the new architectural *terroir*.

‘Act-in-field’

Architecture as an adaptive profession is now faced with responding to the current pandemic situation, while competing with professions in the field of agile management, SW, UX, UI design,¹ business architecture, branding, service design and experience design.² These are professions that have emerged with an express desire to service societal and cultural problems³ in the deployment of design thinking⁴ as a core position and skill set that architectural education have historically sought to engender. Design thinking in a broader interpretation spans multiple professions with many co-opted and shared

perspectives in their approach, but with varying outputs from differing professions. What began as a purely digital endeavour in the mid-2000s has seen the increasing development of seamless interactions between digital and physical experiences,⁵ supplanting many of the more traditionalist views of spatial design. This design thinking approach, married with studies in materiality, extends to the interactions of things and spaces in the service of experience and events as a 'service design' approach to buildings and spaces. The implicit design thinking 'act' of architectures has therefore been co-opted by a multitude of professions coming from the digital into the physical, that is, from one field into another. Central to the emerging role of these co-opted architectures is the understanding of the context in which we operate most specifically: the intersection between the physical and the digital within the service and the production of 'acts' to create novel and engaging experiences in localised places or fields of events. It is argued, then, that the way architectural education should utilise design thinking is to develop and explore ways to strengthen this understanding of actions, events and fields applied to places that strengthen the strategy of how to act. Reinforcing this understanding broadens the scope of architectures' process and action, enhancing the tools with which architects 'act' in the future by positing a framework of that process, in an emerging architect's field or *terroir*: an 'Act-in-field', as we have coined it, that fits within a wider strategy and position.

Our own educational position, generated from both theory and praxis at GBIA–HK, further develops studies in Matter, Experience and Typology in Architecture, assisting students in understanding how we socially construct and make an object (Matter), how we have a shared connection with it (Experience) and what it could look like from different perspectives (Typology). Our premise could be described as the 'drawing-in'⁶ of experience and acts by architects, investigating architectural form as an opportunity to construct new perspectives for architecture and architectural education. Through the intersection of experience design and digital design, studio work can only be achieved by maintaining a type of experience similar to the study trip or site visit of more traditional architectural studio projects (as seen in Figure 1). We began to replace this option to visit and act-in-field with a combination of physical visits complemented by digitally scanned copies of spaces so that students could further explore remotely in a virtual setting.

The limitation due to the pandemic had challenged and accelerated these objectives in our pedagogy, so we collaborated with students to develop their work as one means of design thinking, encompassing the use of experience and digital design as an emergent design strategy termed the 'abductive strategy'. Abductive strategies relate to social enquiry and involve constructing theory that is grounded in everyday activities or in the language, experience and meanings of social actors⁷ that we also extended to constructing architectural form.

Students used this strategy to explore dynamic methods and interactions between physical and digital models, to extend the place of architecture and further enhance the tools and positions of thought within which architects currently act. The specific focus of the action research was to extend the architectural student's design tools in studio and then explore additional visual presentation skills with a wider audience within the programme and to the public. Employing a variety of high- and low-tech mapping, using LIDAR scanners, phones and iPad Pro computers, we were able to capture the Hong Kong environment so that students could continue to design work and explore specific sites remotely. Such work shifted the field within which architects understood and now acted to an emerging architect's 'topophilia'.⁸ Something we have coined as a new 'terroir'.

Figure 2 explores the work of students operating with traditional processes during the third-year design project called 'The scenographers' chapel', with drawings and models that were particularly suitable when exploring emergent strategies of work as a discursive vehicle. Students would normally be tasked with experiencing a 'lived' place in a form of free, unguided play to enable rupturing.⁹ Rupturing in the experience was a particular abductive design process of separating what they experienced from the matter, experience and typology of spaces, in order for them to successfully intersect and reinterpret how they connected socially with the site and the meaning associated with the experience. Recording their perceptions, observations and journeys,¹⁰ and documenting such experiences¹¹ at an abstract level for further investigation, enabled them to observe specific 'actants' and also be aware of their own role as an actant themselves.

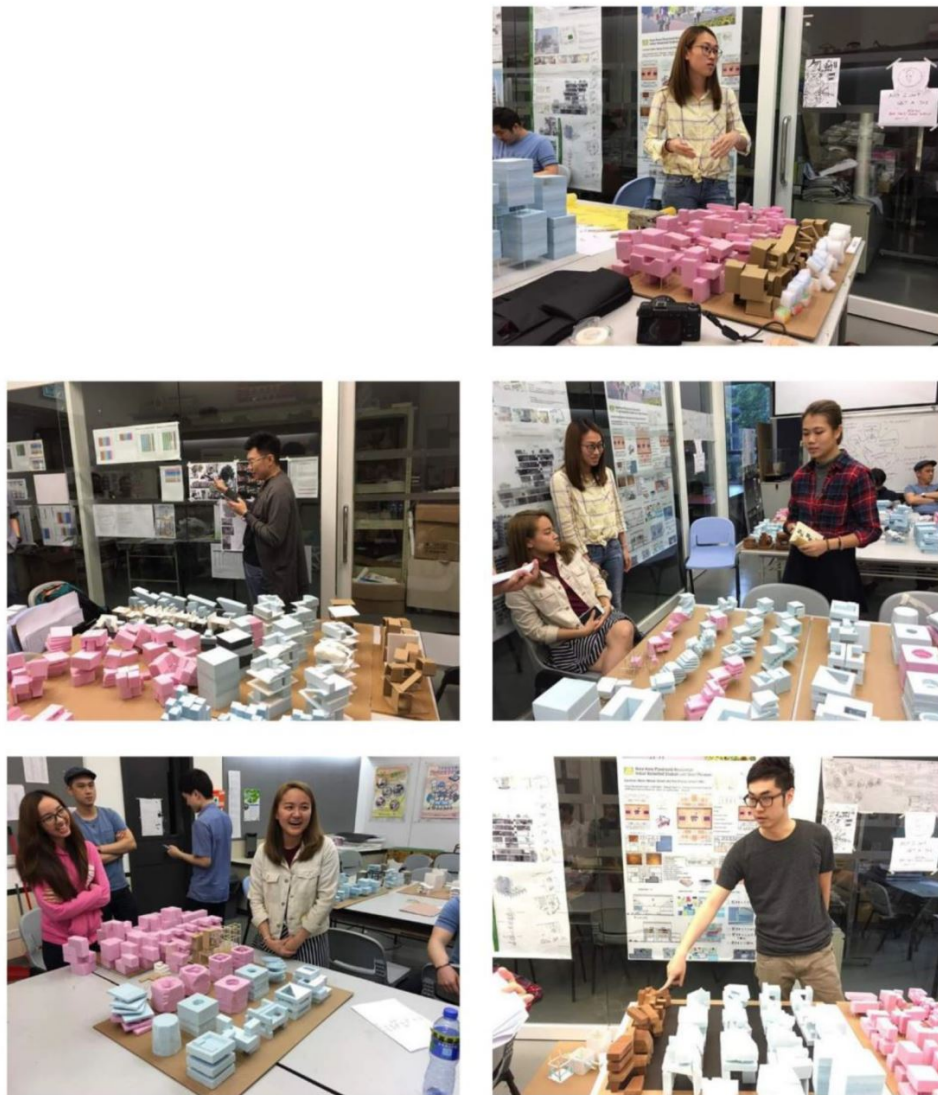
Latour's view of actants is useful here to explain, in a non-anthropomorphic manner, that actants are 'whatever acts or shifts actions ... an actor is an actant endowed with a character'¹² but so too is an object or space. Latour goes on, 'And yet we still don't know how to assemble, in a single, visually coherent

space, all the entities necessary for a thing to become an object ... When we have learned how to do that, we might finally get our (material) materialism back.¹³

We claimed its more conceptual understanding to 'get our materialism back' through digital scanning and augmented reality (AR), despite that being situated in remote places or learning in disparate locations. Subsequently the 'material' information would be assembled and condensed to synthesise the experiences and represent the place as a continuous visual representation. In removing the scale, materiality and shadow from the constructed piece, we fractured the site and place to reform the spatial relationships as a conceptual strategy attempting to deconstruct the actual environment. We referred to this as 'acting' in the field through gesture and motion by the impact of the student on the drawing, the model or the experience. The work would be continuously ruptured to form a series of iterative drawings¹⁴ to speculate on additional narratives and actants¹⁵ within the 2D flat space. This would elicit transient and uncanny¹⁶ interpretations across the territory represented on the surface of the model or drawing that was constructed. The matter of the model and the drawings were expressed as a thing unto itself that had taken on qualities beyond that of the original source and inspiration.¹⁷

Figure 1. Act-in-field in Hong Kong (Source: Louise Janvier, 2019)



Figure 2. Act-in-field design process (Source: Simon Kay-Jones, 2019)

During this period, and contained within the pedagogical process, was a critical guidance and supervision process where the studio functioned as a centre for the phenomenological design strategy where students could act in field. The student's inscribed compositions unfolded as a series of ambiguous objects created either through expressive drawings or physical models. Students went on to interpret the outputs to groups of: (1) rupturing as space and volume; (2) transient events as time and activity; and (3) uncanny forms as meaning and semiotics. Students were clearly thinking through 'acting' or making, and constructed architecture that was grounded in everyday activity, and the language paradigm and meaning of local actants, but crucially transitioned to an abstract level.

The pandemic environment necessitated the use of high and low technologies to replicate or condense the place of experience described above and provide a digital place for students to act in field, replacing the physical studio space as a liberating design generator. The mix of technologies focused strategically on the specific output to best aid the students while also providing a communal discursive space for design development and exploration. The students created digitally local cognitive maps online – or rather cognitive collages in 3D – from which we could elicit meaning from their representation of memory. We noticed that the collages would invariably be grouped around abstract conceptual

ideas (partonomies) and have less to do with catalogues and hierarchies 'of kinds of things' (taxonomies), although they were still present in both the pre- and post-pandemic work of the students.

We thought this was interesting as a consequence of acting in field, and that perhaps this work was a place to locate spatial thinking as a visual ecology of the mind which facilitated the perception by the students of the field (digital inside world and physical outside world) with visible spatial representation. When discussing their work with students we referred to these as 'states of emplacement', and through the 'acting in the field' explained how they had created cognitive maps for spatial cognition. We believe that this spatiality of thought may lead to more abstract thought. However, in order to achieve our objectives and establish whether more abstract thought was prevalent, we were required to translate our process into a suitably clear and concise strategy for ourselves and the students.

'Process-to-strategy'

In the pre-pandemic period, we would traditionally structure the year's sessions and the process of design in studio in a linear format progressing over the course of an academic year (Figure 3). The academic year would evolve through co-creative planning to accommodate the provision of six dedicated visits to Hong Kong. Significant adjustments were made to switch from physical to online teaching during the global events and resultant restrictions. The 'Act-in-field' approach gave us an opportunity to recreate many of the qualities of the studio and the place of positive learning environments that foster creative education. However, there remained the need to shift our process and position as a school of thought from a purely transactional task-driven approach to a more strategy-based process analogous to creative fields.

Figure 3. Process-to-strategy, the traditional approach (Source: Simon Kay-Jones, 2019)



Within this acting-in-field place, our students' work explored the digital relationship between typologies, matter and their experiences connected with the project and activity, using specific strategies to guide their development. One such strategy – the abductive strategy – focused on the meaning and significance that students of architecture placed on the digital and physical work they produced alongside the material qualities represented in digital space as a form of dialogue or semiotics between the material being represented digitally and references to the physical space being experienced.

Beetz describes this relationship in the semiotics of materials where 'the subject as well as materiality are seen as relational effects'¹⁸ upon our understanding of form and matter. Interestingly, students were able to experiment and explore such relational effects between the subjects and materiality of their work independent of whether it was digital or physical. They displayed an ability to separate the subject from the material form because it was a relationship between digital and physical forms. By reviewing previous students' work (Figure 2) as an experiment in the same 'semiotic' rupturing of conventional architectural styles in model making and drawing, we concluded that there was still a rich seam for discussion within this process. While face-to-face sessions had to be replicated online, we also saw that more abstract and experimental work could be developed by mixing physical and digital experiences online.

By reframing students' work from the perspective of Beetz's relational effects, 'act' and artefacts of students appeared to be a playful endeavour that revealed and acknowledged certain ambiguous forms which allowed uncanny experiences to emerge – experiences reminiscent of the traditional studio experience in the pre-pandemic period. The best outcomes from 'students' work' became in effect a play on the realisation of a thought through making collaboratively. Our primary task was to conceive of how to translate this systematically into a structured process with online learning environments while retaining the qualities and flexibility of face-to-face teaching.

While previous student design work¹⁹ maintained an implicit and uncoded aspect of our pedagogy, the digital platforms and experience of mapping physical spaces onto a digital space facilitated more appropriate and formal principles to be codified, and while analysing the elements of students' work at key stages, they illuminated a new, perhaps existential, territory of learning. Further exploration in converting our previous co-creation process for project briefs with Hong Kong and UK academics helped to formulate a strategy for online learning. By focusing on this pivotal experience, we were able to note a specific methodological approach to each project or work task that was beneficial in ensuring a conceptual rigour to the process of strategically acting in the field, while building on what students would have had they been physically in the studio.

Through a series of discursive meetings the team analysed and dissected our new 'places' and 'positions'. Monitoring the success of these strategies was the focal point for our thematic analysis within the architectural students' education. We concentrated primarily on the intersection between the subject and the object of the design process – the uncanny and the transient²⁰ – to balance this craft and process, with the appropriate digital 'places' and 'positions' as an emerging 'place-free' praxis for education. The additional design strategies that emerged could be categorised as follows (see also Figure 4):

- Inductive: Involving the conceptualisation of 'facts' and truths verifiable from observed phenomena and positivistic perspectives.²¹
- Deductive: Involving the conceptualisation of a 'truth' a priori but demonstrable by phenomena until falsified as in critical rationalisation.²²
- Retroductive: Involving the construction of alternative models that are abstracted and examined to establish correlations as 'scientific realism'.²³
- Abductive: Involving the construction of theory that is 'grounded in everyday activities and/or the language, experience and meanings of social actors'.²⁴

Unpacking such principles and strategies was the primary driver and task of our architectural education across the physical and digital; we chose to focus on the abductive. For students, however, the driver was not always in the making, nor in the production, but in the intersection between the craft and the process to the project and the intersection between the virtual and physical dialogue. It was therefore important to refine and enhance established educational theories that could provide a point of departure in the development of our own abductive strategy, which included an understanding of Kolb and Kolb's 'learning cycle' and Vygotsky's 'zone of proximal development' as a prelude to our places and positions for place-free praxis.²⁵

Kolb and Kolb established and developed the notion of a learning cycle from Piaget's and Dewey's model of experiential learning and cognitive development.²⁶ They saw the learners' journey as discrete

While at the time of writing Kolb and Kolb clearly envisioned experience to be 'concrete' in the sense of a physical connection between the learner and the activity at hand, it does not necessarily require the presence of a physical connection or experience in this strict definition to be in play for the premise of a learner's journey to still hold true. Indeed, many of our experiences with students emphasised Kolb and Kolb's final point – that of shared experience being more fully and concretely experienced, leading to abstract experience. We depicted an enhancement of connections between experience and abstract thought when a comparative analysis was possible between physical and digital experiences.

Vygotsky's zone of proximal development²⁹ was also an interesting and established educational theory that could be read on two levels as applied to our notion of places for a place-free praxis. Vygotsky observed the particular relational dimension of spaces and actants, their environments and peers – similar in essence to the way Beetz framed relational effects – to the development and shared learning of the student:

an essential feature of learning is that it creates the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when ... interacting with people in his environment and in cooperation with his peers.³⁰

Again, the extent and boundary of this 'environment' was not fully explored at the time, whether it was a physically dependent phenomenon or wider in remit, but Vygotsky did refer to the zone of proximal development on both psychophysical aspects and a spatial perimeter to experience as a shared environment. It is around this interpretation that we have developed our ideas of the 'places' of learning contained within our new 'terroir'.

The reading of both Kolb and Kolb and Vygotsky in this manner provides us with the opportunity to link the sequential learning of Kolb and Kolb, in terms of a learner's experience, experimentation and synthesis, with Vygotsky's construction of peer, psychophysical development and spatial proximity as a spatial perimeter to experience independent of physical/digital distinctions, perhaps even enhanced by the interplay of such physical/digital comparisons.

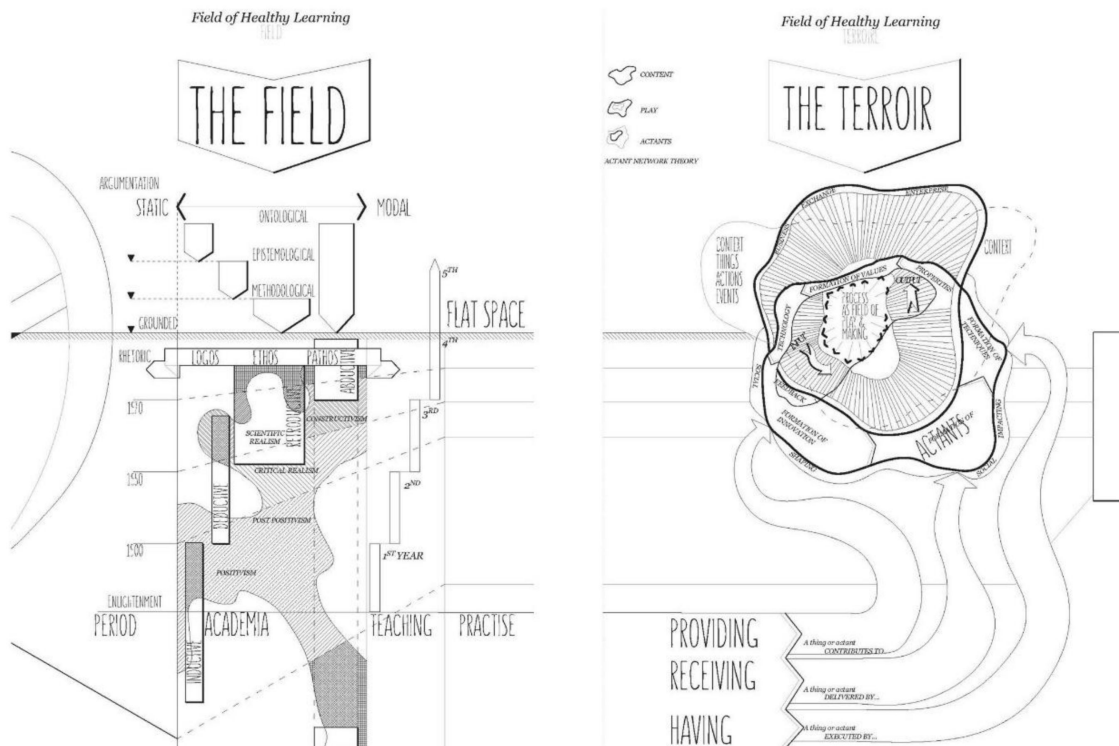
The students' tasks (Kolb and Kolb) – suggested as a journey – were linked with the place of learning (Vygotsky) – mentioned here as 'action-in-field' – and blended together with new forms of design strategies. The aim of the new type of content of digital experiences was to produce a studio territory across digital and physical learning environments, and a more structured learning path was then created through an enriched learning cycle. This activated students' field of enquiry comfortably enough to experiment and present work in reviews online. Studio group projects could then be linked to individual projects in order to expand in student potential, while developing a 'deep learning' in the student which left traces of this online event in a digital field space or 'terroir' of learning (Figure 5).

Collectively, the academic teaching strategy provided positive learning environments that allowed students the flexibility and inspiration to develop their own motivation through shared experience.

The diagrams represented in Figures 4 and 5 attempt to depict a structured timeline of pedagogical methods superimposed onto the architectural students' learning journey. They offer an additional and alternative formulation to the conventional approaches of educational learning in terms of its place and its pedagogical and thematic position.

Such pedagogical positions – particularly the abductive strategy that we examined – opened up specific and episodic material choices for students that could elicit different experiences in digital places as a shared experience. We believe this process often enables students to reflect on apparent pseudo-certain formations in their design responses such as overly fixating on labelled functions to spaces early on, for example (the *why not?* creative approach). Alternatively, students' reflections on potential contradictions in judgement and the decision-making process, which limit creativity, are due in part to a tendency for structural biases to form, for example, predicating a particular function or use of materials or shapes prior to exploring opportunities (the *what if?* creative approach). Final student reflections could include specific framing of temporal episodic events or experiences (the *what next?* creative approach). All of the pseudo-certain effects and formations appeared to be limited to either physical or digital environments, but, interestingly, they were less prominent in discussions with students when the boundary between digital and physical places were blurred. Moving between digital and physical as a part of the strategy – for example, 3D printing a digital model, working with it physically and then capturing the model with photogrammetry – assisted the development of the students' work. It was therefore important to develop strategies that could function in either physical or digital places as a place-free praxis.

Figure 5. The field and terroir of learning (Source: Simon Kay-Jones, 2021)



Conversely, the boundary between digital or physical places for learning – moving from a digital platform to a physical studio space, for instance – which we could call ‘frames’, are of particular note as they exhibited typological boundary effects³¹ – the moving from a physical frame to a digital one, for instance. They could be compared to the relational affects of Beetz and zones of proximal development by Vygotsky. Effects were evident between frames of experience, with the order and type of digital physical experiences appearing to influence the approach by students, although at present it is unclear how. Perhaps typological presentation (the emergence of a typological boundary effect from one frame to another) can change what is anticipated in the mind that experiences and feels by anticipating differences prior to being evidenced. A form of perceived recall or illusion, along with a design strategy such as the abductive strategy, early on, could, rather than hinder students’ creativity, ensure that they navigate the boundary between digital and physical places correctly and reflect on specific perceptions and experiences so as to be able to concentrate on particular events at hand. The strategy could assist in constructing a journey.

'Construct-a-journey'

A key tenet to our approach – the learning process for those enabling creative leaps between the frames (which we described in the strategy from the last section) – becomes important *within and between* physical and digital places that we choose for learning. And while it is important for a flexible strategy to be concise and clear, a specific journey is also vital, one that maps out the learners' journey as a sequence of frames or places for experience either digitally or physically within a wider shared experience of proximal learning. In this way we can cater for both active and experiential sessions,³² while we also cater for the variation in productivity mapped onto the learners' journey³³ within the course (Figure 6).³⁴ This approach retains some of the transactional approach to learning that is prevalent in many exclusively online courses, but, importantly, situates this journey within the wider digital and physical place of learning we have established. Even more crucially, it is seen not as a static fixed journey, but more as fluid, responsive and adaptive to peer influences occurring in the proximal zone.

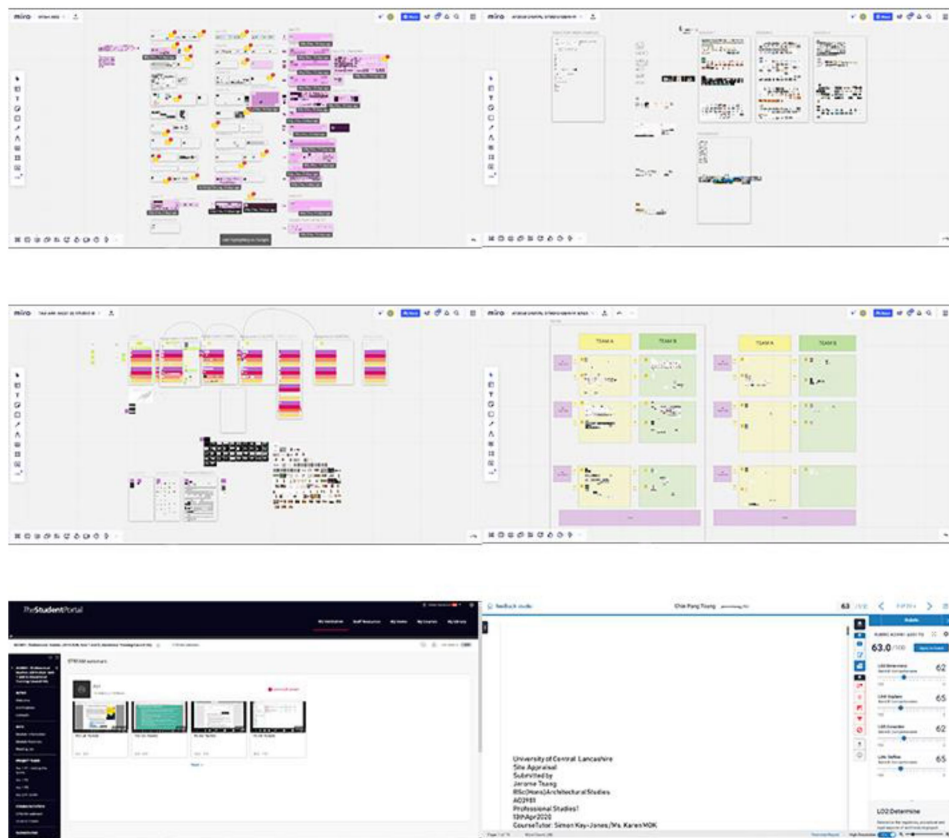
Figure 6. Construction of the learners' journey (Source: Simon Kay-Jones, 2021)

Initially the student outcomes from these journeys were displayed on presentation boards in a physical space which were then re-created digitally using Miro virtual presentation boards and later Hubs 3D digital environments. The method was highly effective for viewing the work of a whole cohort of students for collaborative discussion, grading and external examination purposes. However, maintaining motivation was only possible by handing students ownership of the process, the journey and content of their study. They needed to feel comfortable enough to experiment and fail, while studio group projects had to be linked to individual projects in order to push students to excel and develop 'deep learning'. It was important (similar to the physical studio space) that the places and positions of their education were co-created with them. Providing positive environments digitally for learning offered students the flexibility and inspiration to develop their motivation in a peer-reviewed environment, echoing the physical studio.

Our face-to-face, or asynchronous learning, sessions offered dynamic, flexible environments for learning while responding to the alternating mood of learners, the proposed tasks and focus of the subject matter. Digital canvases such as Miro enabled flexibility and a point of reflection for students to visually gauge both their individual and collective progression (Figure 7). Students could access real-time conversations occurring online and view ongoing work produced and accumulated within a timeframe to further understand the correlation between guidance, the review session and final preparation for the external examination with external critics. Recorded sessions were also available via the linked online learning environment at our university in the form of Blackboard, Streams, Turnitin and Teams spaces. During all these activities, the learners' well-being, too, continued to be a defining factor in terms of

whether cognitive ease was achieved and with it, their capacity to tap into their curiosity and pursuit of creative leaps within the digital places. Tutors who visually facilitated the 'drawing-out' of the learners' motivation in the digital places were able to chart the optimal path and process to a learner's journey in dialogue with the student.

Figure 7. The online learning environment in action (Source: Simon Kay-Jones and Louise Janvier, 2021)

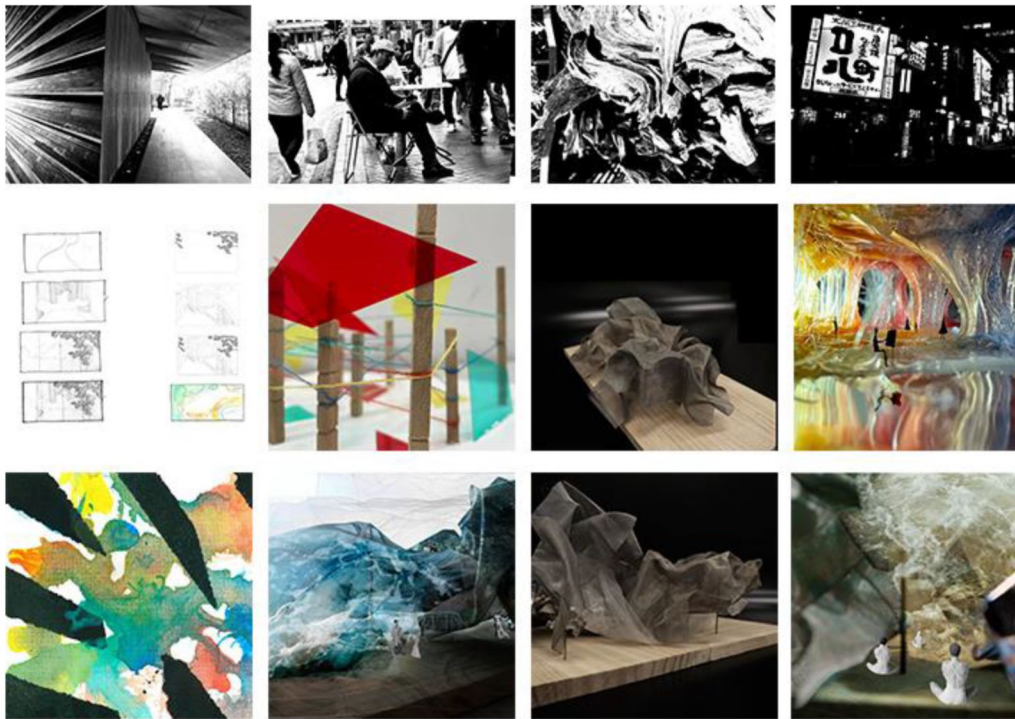


It was evident that more engagement online, with such flexible environments for learning, needed to respond to the changing nature of learners, the task at hand and subject matter under focus, rather than merely provide a digital twin of pre-pandemic education. Therefore, student-centred learning paths needed to pass through a number of different learning stages or 'frames'. These frames invariably became tailored to providing an optimal learning environment for students to be engaged with specific tasks and strategies. Students were successful in moving between frames without breaking the flow of the group or the progression of a project, working seamlessly between physical and digital studios. Perhaps more critically, these frames could accommodate individual learner types and their unique preferences within their 'learning frames'. In fact, learners could move from one type to another through the course of their experiential learning process, so the digital and physical strategies were structured to accommodate the various aspects of all learners. We learnt that the strategies could remain independent of the learners' approach by constructing a journey.

Examples of the initial visual outcomes from these learning journeys during the research illustrated similarities to pre-pandemic work and its focus and direction, but showed a tendency to concentrate on the sensory experiences captured in a physical space using just photography and sketching (Figure 8). However, the outcomes were transposed and developed further into an abstraction from the imagery, focusing on the interior frame of reference as a starting point. The students then appeared to internalise the experiential approach of the course to specific places and spaces, unlike in pre-pandemic years where the result was a predominance of typological and volumetric studies, a process we referred to as

'thinging'³⁵ in the past but now seemed to shift more aptly to 'framing' mentioned earlier. After reflecting with the students, the studies were viewed as a territorial experience of digital and physical experiences of matter and spatial compositions made by students. For example, the prevalence of volumetric studies was supplanted with studies and series of boundaries of materials that defined spatial experience. There seemed to be a subtle shift in focus and, being digital, offered students the possibility of experiencing such studies in novel ways, to compress the encounter of the study, its experience and its measure of intent behind the spatial composition as a unified event in one digital experience.

Figure 8. The reassembled design strategy in blended learning: experiencing rupturing and assembling (Source: Simon Kay-Jones and Louise Janvier, 2021)



As part of their studies and in keeping with our school position, students were tasked with exploring material engagement theory (MET) because it applied to material and spatial qualities in architecture. The concept of the MET that we presented to students encompasses matter, which becomes the medium of experience, how it is moulded, shaped and formed by the sculptor, for instance. This evidences the plastic mind drawn into a plastic culture, for example, how it shapes and influences our perception as it is being made, and how it forms a shared understanding or experience. MET theory calls this plasticity. This, we felt, echoed strongly with our own educational position of developing studies in Matter, Experience and Typology in Architecture to assist – as we indicated in the 'Act-in-field' section – students in understanding how we construct and make a thing socially (Matter), how we have a shared connection with it (Experience) and what it could look like from different perspectives (Typology).

It was important to maintain the school's position and explore how this influenced students in investigating architectural form and provided an opportunity to construct new perspectives for architecture. MET theory was easily appropriated into spatial configurations of territorial experience with a focus on the framing of a material surface,³⁶ which Malafouris describes as 'a mutability of form, matter, and type; simultaneously with experience, action and meaning', a 'metaplasticity'.³⁷ In our context this is a digital place, similar to MET theory.

The digital spaces and interactions described between the studio, student and digital environments captured the 'states of becoming', as MET theory refers to it as an interrelation between the act of experiencing of Malafouris's metaplasticity, a collection of scanned materials or, more precisely, a

cognitive life of matter and spatial experiences evidenced by a student's journey. The students had created the conditions for a digital urban ecology connecting the external spaces with digital copies and exploring the interplay of actions, matter meaning and experience as a constructed journey.

'Experience-the-terroir'

Part of constructing a journey is implicitly acknowledging a larger territory or place within which that journey exists and the position one can experience in that place. Investigations into low- and high-end digital technologies initially involved experiments using virtual reality (VR) for concept modelling and revealed the multiple stages in their design's ideas in which students could immerse themselves virtually to explore the experience of this new territory (Figure 9). In addition to the conventional design processes of AutoCAD and Sketch-up, students mastered technologies at an earlier stage of the design development. Through the further exploration of design studies in modelling and architects' drawings, it appeared that students were exploring the emergent intersection between experience design, material agency and MET theory that had been outlined to them in the studio sessions, while constructing their own journeys in a shared proximal zone.

As part of that strategy and journey, students were tasked with exploring material engagement theory. Of particular focus was the 'framing' of interactive assemblages³⁸ of digital and physical experiences. These cognitive collages could be made digitally and experienced virtually and allowed students to construct and support shared experiences in material matter. Through this digital network of spatial (models) and nonspatial structures (concepts, abstract ideas and peer reflections), particular spatial journeys were established as frames within a shared territory for thinking and experiencing, created in the online digital environments. Such shared territories became devices to construct certain universal places, specific and episodic assemblages (frames) of matter and typologies that students could experience, thus forming a new terroir of their experience. Students were abstractly and conceptually able to respond to these ideas with an experience of design combined with space. Whereas in the past deep learning had its limitations, now students could experience that deep learning 'concretely'.³⁹

Previously, little attention was paid to the experiential and speculative spatial qualities of new forms of digital places, their potential architectural applications and material agency to evoke positive experiences. It is possible that these virtual spaces may at once be the 'framing' upon which to build material engagement (scanned material records of space), while at the same time being contingent on more than merely vision-dependent inputs (more than just VR interfaces). The layering of technology may be part of meta-methodologies: a cognitive ecology that exists when frames of digital experiences bind together urban ecologies (scans) – the places of our education – with ecologies of mind (perception) and reason (decisions) – the positions of our education approach – into a shared terroir of experience for our place-free praxis in education.

'Framing' therefore appears to be particularly necessary for reflection (including memory formation, meaning and cognition perhaps) within these digital places. The theoretical framework illustrated is a developmental stage generated from the material engagement of things, and in MET theory to a more spatial framework in the framing of choices and the nature of embodied and enacted thought in materials and experiences, whether digital or physical.

The new terroir indicates that such experiences may be extended to the conceptual level of thought in abstract imagination when visualised in digital places. Tversky indicates as much with her assertion that the 'same brain mechanism in humans that represents actual places also represent ideas in conceptual spaces and that spatial thinking in particular enables abstract thinking'.⁴⁰ It is not yet clear whether this is limited to specific situations or broader in scope; however, it may also indicate the potential for a systemic biased process in these mechanisms for experiencing and forming judgements in digital spaces to which spatial judgement bias could be mirrored in cognitive and conceptual judgment,⁴¹ as we indicated in the pseudo-certain formations described in the 'Process-to-strategy' section. This could certainly lead to more interesting research on the nature and type of experience of space and materials, whether digital or physical, that leads to abstract thought. How designers experience space was a material matter (even digitally) and certainly a vehicle for conceptual thought.

The approach outlined within the 'Act-in-field' section therefore turns process into strategy for the construction of a learner's journey. Students quickly adopted these themes, digital spaces and technologies, which provided the ability to create 'framing' devices to build upon material engagement

and simultaneously provide outputs beyond visually dependent perspectives. Students' work was contingent on material matters, even though there were multiple digital interfaces.

Figure 9. New experiments in capturing the reality of spaces and models: experiences and process
(Source: Simon Kay-Jones and Louise Janvier, 2021)

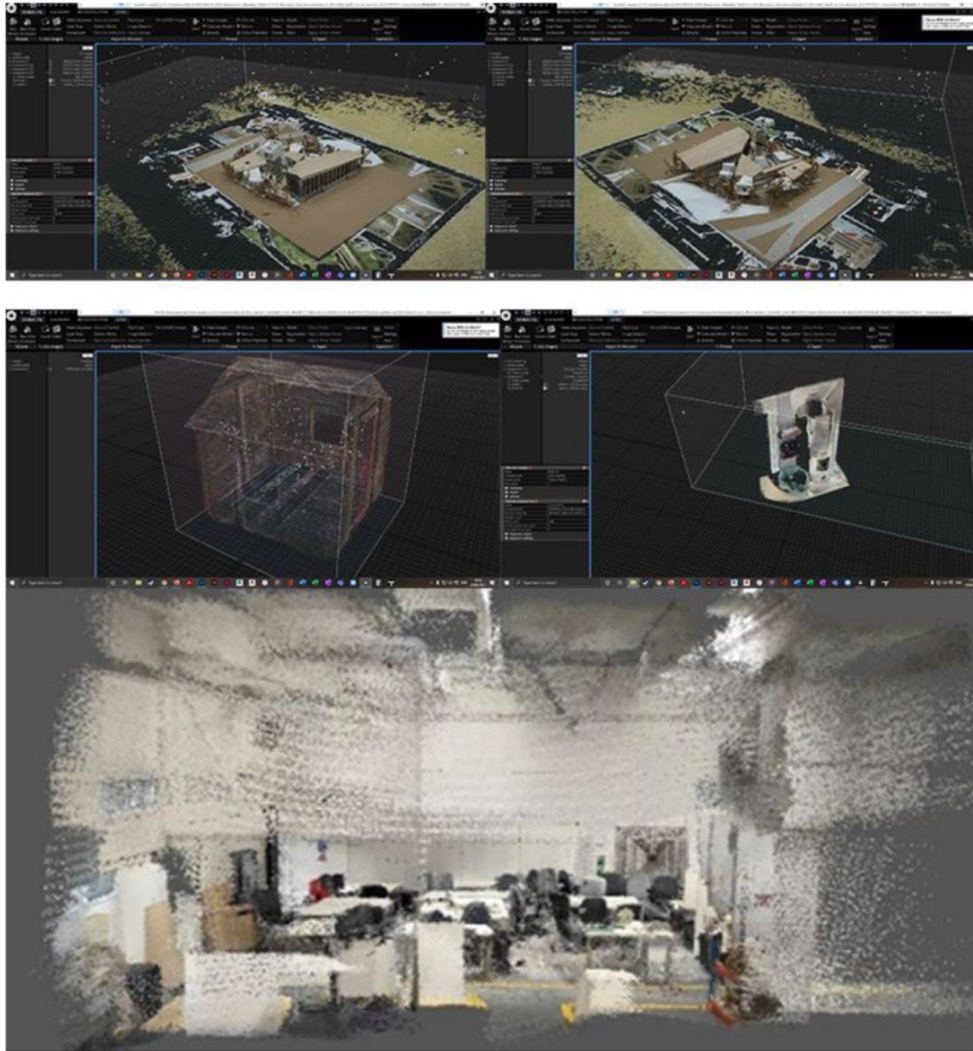


Figure 9 illustrates interesting observations and discussions about the digital experiments and capturing real spaces for the studio terroir. Students remarked on the temporal ruptures between the subjective and objective perceptions of both the real and scanned versions of places, and the inherent design possibility in exploring further the specific qualities of the experience, which could either heighten or avert spatial illusion. The degrees of separation of this 'rupture' we called the *lustre*, a measure of the degree of ambiguity between the subjective and objective frame, and speculated that this was crucial in the creativity of design.

Our educational framework now developed as part of a set of design meta-methodologies that form cognitive ecologies as a collection of themes, processes and strategies (our positions), with spatial terroirs as territorial experiences (our places), and digital and physical assemblages as 'framings',⁴² which by their nature exploit a form of meta-plasticity⁴³ to the benefit of creativity. Collectively this occurs in our new terroir.

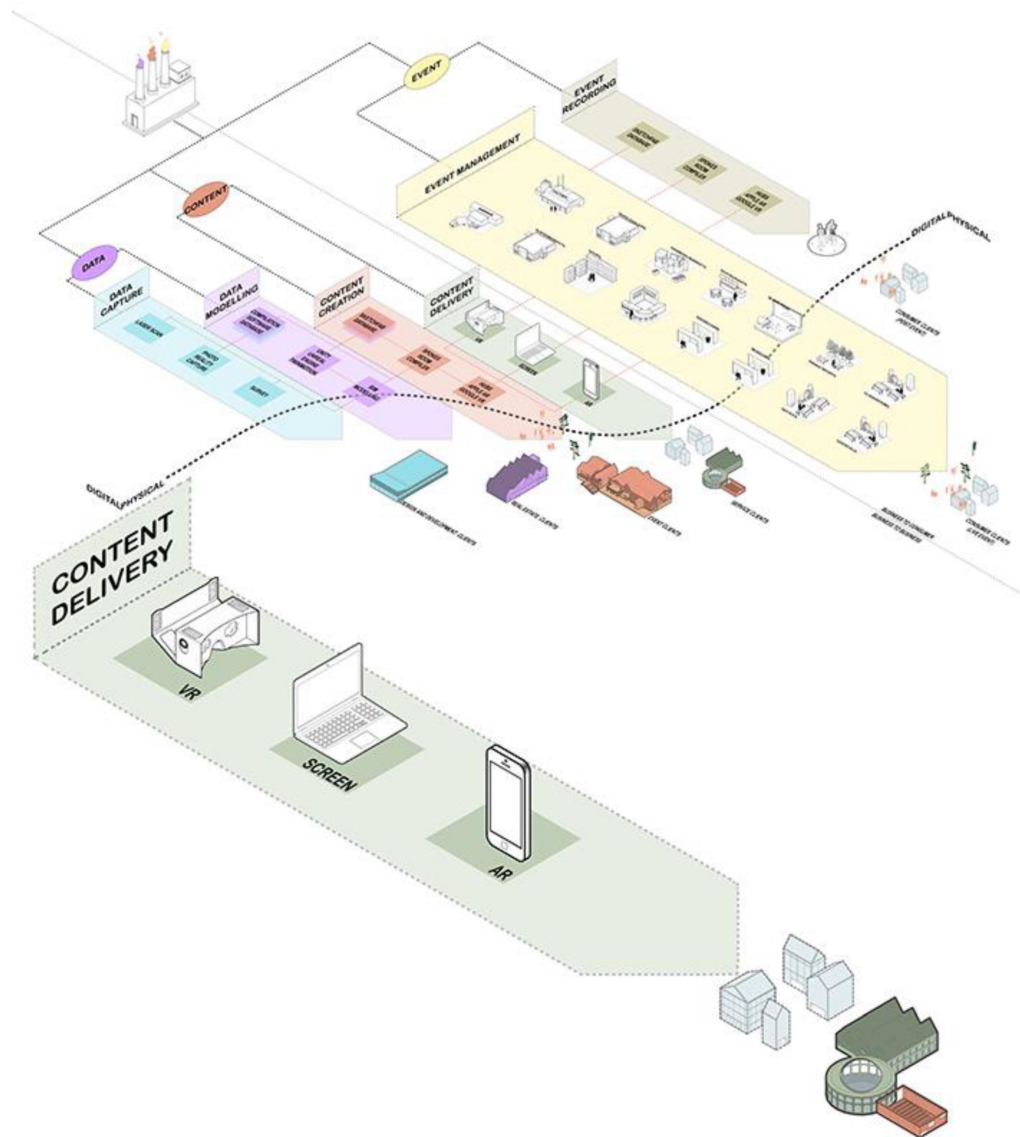
We have since engaged in further work that has developed particular digital places that could be traced and navigated cognitively through a terroir with varying states of experiences, including

motor-influenced (mobility navigation), cognitive enquiries (problem solving) and psychophysical states (wellness, depression and outlook). This forms a wider territory and scope of spatial cognition, typological boundaries and material surface directly affecting experience, all of which would be novel and new themes and directions in which to take our new school position.

At GBIA–HK, our pedagogical approach and focus is on examining and exploring the design process as an *alternative position and new place* that seeks to balance the craft (whether digital or physical) and process (whether strategic or thematic) with the appropriate digital ‘places’ and ‘positions’. As an emerging ‘place-free’ praxis for education we seek to address an emergent intersection between experience design and material agency with spatial and material engagement.

Through the experiences of spatial and material engagement with architecture these layers of capturing and co-creating digital spaces (Figure 10) create new emotive and spatial experiences at the intersection of these alternative perspectives on architecture and architectural education.

Figure 10. Conceptual overview of the layers of capturing, co-creation and experiencing through digital technologies (Source: Simon Kay-Jones, 2021)



Conclusion: shifting from territories to terroirs

Specific lessons were drawn from the students' work using the four themes: 'Act-in-field', 'Process-to-strategy', 'Construct-a-journey' and 'Experience-the-terroir'. Critically, the formulated process requires all four elements to sequentially interact, offering an enriched student experience and learning landscape in which they can operate successfully, while creating a collaborative VR exhibition in which to display work and heighten the human interaction and connection between Hong Kong and the UK. The four themes have enabled research through the architectural design praxis, examined specific architectural designs in digital places and developed the students' 3D skills while providing the opportunity to simultaneously compare and peer review work and to engage in further dialogues.

The themes and processes collate into an alternative school of thought as our new position on developing the technology moves forwards. The digital and physical environments that we utilise and that are created by students provide us with an emergent alternative place for education. More recently, GBIA–HK and UCLan have opened an immersive learning lab as a space located at the university that is dedicated to exploring and developing applications using VR and AR, in a variety of teaching and learning pathways (blended, online and face to face) to enhance teaching and learning experiences.⁴⁴ The objective will be to create further content for the UK–HK curriculum with further real-life case studies using VR and/or AR in the classroom.

Ultimately the project aimed to investigate the qualitative impacts of novel and new technologies adapted into the praxis of architectural education along these four key themes that are supportive of a peer-led, positive learning transnational environment, while providing a structured approach for reflexive educational design in a particular time of flux. Our four key themes outline a broader territory of digital and physical encounter with blended online learning that we have claimed as the new 'architectural terroir'.

Notes

- ¹ Agile management, SW, User Experience (UX) and User Interface/Interaction (UI) design are all modes of design thinking with inherent management theory attached and rely on creative design processes primarily within a digital and service design setting to business.
- ² See design factors influencing form and matter in Heekyoung and Stolterman, 'Form and materiality'.
- ³ See Wensveen and Overbeeke, 'Fun with your alarm clock' on interaction design with objects and the concept of funology.
- ⁴ See Rose and Walton, 'Factors to actors' on posthumanism, factors and actors.
- ⁵ Bolt, 'Material thinking and the agency of matter'; Wilberg, *The Materiality of Interaction*; Dianti et al., *Tangible Interaction*; Niinimäki et al., 'Studying experimental touchpoints'; Peine and Neven, 'From intervention to co-constitution'.
- ⁶ See Kay-Jones, 'The rupture'.
- ⁷ See Denzin and Lincoln, *Handbook of Qualitative Research*; Lincoln et al., 'Paradigmatic controversies'.
- ⁸ See Yi-Fu, *Topophilia*. The architectural layering of the 'terroir' can be seen as a new architectural dialectic term found in the Meta Modernist realm of VR and AR space.
- ⁹ See Kay-Jones, 'The rupture'.
- ¹⁰ See Kay-Jones, 'The rupture' on drawing as a manifest rupturing of Žižek's *Parallax View*; Žižek, *The Parallax View*; Knappett, 'Animacy, agency, and personhood'; Clark, 'Where brain, body and world collide'.
- ¹¹ See Yi-Fu, *Topophilia* in connection with Rose and Walton, 'Factors to actors'.
- ¹² Akrich and Latour, 'A summary of a convenient vocabulary', 259.
- ¹³ Latour, 'Can we get our materialism back, please?', 142.
- ¹⁴ See a detailed explanation of rupturing in drawing in Kay-Jones, 'The rupture'.
- ¹⁵ See Latour, 'Can we get our materialism back, please?'; Akrich and Latour, 'A summary of a convenient vocabulary'.
- ¹⁶ See how the uncanny as a notion influences the formation of memory and place recollection, as residual memory in Trigg, *The Memory of Place*.

- ¹⁷ 'But then why do we so often act as if matter itself were made of parts that behave just like those of technical drawings, which live on indefinitely in a timeless, unchanging realm of geometry? Why, in the name of "mechanical philosophy" ... do we still take this view of technical artefacts so seriously – as if the ontological qualities of matter itself were the same as the ontological qualities of drawing and moving parts around in geometrical space?': Latour, 'Can we get our materialism back, please?', 139.
- ¹⁸ See Beetz's work on the relation of semiotics to materials and experience: 'Material semiotics'; Burnard et al., 'Building material naturalness', 112.
- ¹⁹ The images in Figure 8 illuminated the core unwritten principle of rupture as an existential ground and integral part of the design strategy. The rupture was an act that students worked towards in uncanny and transient states.
- ²⁰ Upon reflection, the rupture at once separated – momentarily – a subject and its object and at the same time announced the connectivity by the very act of rupturing. Tschumi's early work influenced the notion of rupturing from the perspective of placing a disjunction between the conceptual idea of the architectural project and the manifestation of this work in the physical realm: Tschumi, *Architecture and Disjunction*.
- ²¹ A common example of this strategy would be the early work of Le Corbusier and the development of le modular.
- ²² A clear example of this is the work of Tadao Ando and the early development sketches produced to rationalise the architectural form.
- ²³ Perhaps the clearest example of this process would be the early work of Peter Eisenman, Houses I–IV.
- ²⁴ This is perhaps the latest and most emergent design strategy. We may look at architects such as Juhani Pallasmaa's and Peter Zumthor's writing on this phenomenological starting point. However, the authors' intent is to arrive at a more empirical phenomenology than that outlined by Pallasmaa or Zumthor.
- ²⁵ See Kolb and Kolb, 'Learning styles'; Vygotsky, 'The development of higher psychological processes'.
- ²⁶ See Kolb and Kolb, 'Learning styles' with reference to Piaget's and Dewey's models.
- ²⁷ See Kolb and Kolb, 'Learning styles'.
- ²⁸ Kolb, *Experiential Learning*, 21.
- ²⁹ See Vygotsky, 'The development of higher psychological processes'.
- ³⁰ Vygotsky, 'The development of higher psychological processes', 90.
- ³¹ Typological boundary effects may be present when we view physical and digital places as frames in events. We could compare these on three levels: minimal comparisons as a simple comparative analysis; topical, as a comparison between two items in the context of an environment; or comprehensive, as a comparison of two items or more in a context juxtaposed with other concurrent preceding experiences.
- ³² The learners' well-being is, and will continue to be, the defining factor in achieving cognitive ease, and with it, their capacity to raise their curiosity in pursuit of driving motivation to achieve creative leaps. Mentors that facilitate the drawing out of the learners' motivation map, with its pressures and ambitions, will be able to chart the optimal path and process for the learners.
- ³³ Returning to the role of architectural education and educators, a recalibrating of the learners' journey is acknowledged, one that takes cognisance of tempo, of fast and slow thinking, with moments of stress and high productivity. By providing a systematic approach to structuring this journey, education can nudge the future role of the architect towards an understanding of the context in which they operate between the intersection of the physical and the digital in the service and production of work. Architectural education should therefore not teach the body of knowledge and the attainment of skill as distinct, separate canons, but allow for the momentary rupture to be enacted to generate the architectural project where knowledge and skill are constructed concurrently through work, as a critical point of departure. It would certainly assist in understanding how we should work in the future.
- ³⁴ See fast and slow thinking in Lu and Roto, 'Towards meaning change'; Kahneman, *Thinking, Fast and Slow*; Kahneman and Tversky, 'Choices, values, and frames'.
- ³⁵ 'Thinging' is a territorial experience of material as a presence embodied and extended in acts of assemblage between the agent and the subject. The experience of matter in materials is then

the process towards a conflation of the compression where encounters, such as the action of experiencing the matter of material and the measure of intent behind spatial assemblage, are conflated as a unified experience.

- ³⁶ MET theory views the creations of objects, sculpture and, more broadly, spaces, and volumetric studies as a form of plasticity in subject and context at varying scales and temporal rhythms that coexist within the virtual spaces.
- ³⁷ Malafouris, 'Metaplasticity', 56.
- ³⁸ See Muller, 'Assemblages'.
- ³⁹ Beetz, 'Material semiotics', 112.
- ⁴⁰ 'The sixth law of cognition: Spatial thinking is the foundation of abstract thought'. The same neural formations that serve spatial thought, serve abstract thought. The same brain mechanism in humans that represents actual places in real spaces also represents ideas in conceptual spaces, and spatial thinking enables abstract thinking. See Tversky, *Mind in Motion*, 72.
- ⁴¹ Tversky, *Mind in Motion*, asserts that spatial thought has a systemic biased process in its mechanisms and judgements, and that spatial judgement bias is mirrored in cognitive and conceptual judgement.
- ⁴² An authoritative view on this can be found in Malafouris's work: see Malafouris and Renfrew, 'The cognitive life of things'.
- ⁴³ See a description by Malafouris, 'At the potter's wheel' and Malafouris, 'Metaplasticity'.
- ⁴⁴ The lab has in-situ e-learning developers so that both teaching staff and students can learn how to use the technology available, discuss applications for teaching and learning, and then implement taught sessions using the technology.

Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

The authors declare that research participants' informed consent to publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflict of interests with this work. All efforts to sufficiently blind the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

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