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Title:
Making in the Void: How changing to online delivery shifts the focus of teaching and learning for landscape studio

Date:
2021

Citation:
Walls, W., Barrins, J. & Johnson, F. (2021). Making in the Void: How changing to online delivery shifts the focus of teaching and learning for landscape studio. Landscape Research Record, 10, pp.47-58

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MAKING IN THE VOID: HOW CHANGING TO ONLINE DELIVERY SHIFTS THE FOCUS OF TEACHING AND LEARNING FOR LANDSCAPE STUDIO

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1 ABSTRACT

This paper interrogates how the shift from a collective physical learning environment to an isolated distance learning environment has impacted the focus of teaching and learning in the landscape studio. The research draws on the collective experience teaching six discrete landscape architecture design studios across two institutions in Melbourne, Australia. Data from faculty observations, reflective surveys, and workshops on shared teaching experience has been collected and reviewed across a full year of online teaching. For this paper, the observations and findings from this initial work have been aligned with pedagogical theory to understand how online and face-to-face learning combinations might be harnessed for future studio development. Outcomes from the research suggest differentiating the skills that are taught in the design studio and how these can be supported with online teaching formats. Further, the changing nature of social interactions including connection and isolation as integral parts of design studio teaching can be better understood considering the conditions of the online environment. These findings contribute towards the pedagogy of landscape design teaching as it continues to adapt to completely online or hybrid teaching modes.

1.1 Keywords:

Design pedagogy, remote learning, studio teaching, landscape architecture

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2 INTRODUCTION

The 2020 global pandemic forced major changes to the education sector. For design teaching, moving the studio learning environment into online delivery upended many of the conventions of face-to-face learning and teaching. In Australia, the pandemic shifted learning from the classroom to online in March 2020, and the need to rapidly redevelop studio subjects highlighted some of the unique pedagogical conditions of design studio teaching for landscape architecture. This posed a dilemma for some instructors about how to recreate or replace the learning environment of face-to-face studio experience. As was feverishly discussed in Landscape Architecture press at the time (Brey, 2020), there has long been a hesitancy to move design studio online within the discipline.

2.1 From Atelier to Lab: the long tradition of learning through design studio

The pandemic has forced an exploration of the dematerialisation of the atelier as an embodied space (Dreamson, 2020). How students learn through studio is well documented. Design workflows promote an understanding of process-based learning which incorporates development of new skills and design language as an iterative and fluid way of investigating potential problems and solutions (Gazvoda, 2019a, 2019b; Ledewitz, 1985; van den Brink, Bruns, Tobi, & Bell, 2016). While student projects are often independent, studio learning culture is premised on a collaborative group experience that values experimentation, discussion, and feedback. Frequently, the process assumes that the learning activities occur in a physical space of the classroom, workshop, or lab.

Even emerging ideas about digital studios have focused on the uptake of digital tools within the physical studio environment as opposed to the digitisation of the studio environment itself (Gazvoda, 2019a; Walliss & Rahmann, 2013; Walliss & Rahmann, 2018). Within the studio learning culture, there are core assumptions about the value of a collective learning experience, which has led to some resistance to delivering design studios online. Particularly, the difficulty of translating the processes of design experimentation and feedback into a digital space. As Abbott and Bowring (2019, p. 297) explain;

“While there are many digital platforms for co-creation and collaboration, during the fluid stages of design the digital environment can have the effect of designs appearing to be finished because there is a sense of resolution to the images. This can limit the explorative process, with a tendency to keep things neat rather than messy and evolving.”

Subsequently, prior to 2020, there were few examples of online design studios, including landscape architecture. The previous hesitation in developing online studios left considerable gaps in online studio-specific teaching methods (Dreamson, 2020; Fleischmann, 2020). As the open discussion in Places Journal (2020) revealed, many design educators felt the loss of face to face interactions, incidental conversations and the dynamic ‘culture of studio’. Even as the technical showcasing of design work though online pin-ups become easier, the way in which teachers and students interact had fundamentally changed. Where in-class design charettes include chatter and accompanying feedback, the online experience can lack incidental interaction and collaboration (Crolla, Hodgson, & Ho, 2019; Neal Dreamson, 2020; Jørgensen, Karadeniz, Mertens, & Stiles, 2019). Across these concerns is the role of relationships and interactions as a critical component in studio-based teaching. As Neal Dreamson (2020, p. 485) summarises, the persistent hesitancy to teach design studio online ‘are related to social components.’

Thus, the pandemic forced instructors to confront the very architecture which envelopes teaching practice and how that space influences our behaviours and responses. The online mode of teaching demanded instructors more directly enable ideation and mediate the process of studio. This Included new modes for demonstrating technique alongside expanded, and sometimes forced methods of interaction and feedback. This paper is dedicated to unpacking these approaches specific to teaching landscape design studios, with the aim of highlighting where landscape design techniques can benefit from varied approaches to modes of learning interaction and connection.

2.2 Methods

The research draws on the collective experience teaching six discrete landscape architecture design studios across two institutions in Melbourne, Australia which were taught online during the COVID19 pandemic of 2020. The studios covered a range of undergraduate and masters level study including;

- Three undergraduate design studios, from the second and third years of the three year Design and Landscape Architecture bachelor degrees.

- Two first year masters studios
- One second year masters studio.
- One interdisciplinary masters design studio including students from architecture, landscape architecture and urban design.

The content of these studio-based subjects varied considerably from foundational design methods through to more specialised technical instruction using digital simulations. Consistent across these studios was small group learning, site-based design briefs and the introduction of design techniques and methodologies that were new to each group of students. As a collective case study, the studio subjects used here represent a landscape focused investigation of design pedagogy.

The design studio subjects used for this research were taught entirely online with no blended or face to face options. Studio sessions were conducted via the online platform Zoom alongside the collaborative digital workspace Mural. Studio classes run for six hours per week, with the expectation that students will continue with their work outside of these teaching hours.

The collection of studios used for his research were taught across the two teaching semesters in 2020. This resulted in later studios being refined based on prior learning and in response to the rapidly changing restrictions from the pandemic. Melbourne underwent some of the strictest lockdown measures in the world, including limited time outside, restrictions on distances from home and curfews ("City Locked Down for Three Months Has Bleak Lessons for the World," 2020). In addition, many students were offshore. Considering the constraints of the online environment, certain interactions would not occur. In reconfiguring for online teaching throughout 2020, the design studio pedagogy was iterated through the interrogation of two levels of studio interaction – between student and instructor and student to student, with the aim of bridging the pre-existing gap between traditional landscape studio teaching methodologies and the exclusively online environment.

Data was assembled in two primary ways. Faculty observation was collected through ongoing discussions and feedback amongst staff throughout the semesters. These discussions were followed by a more formal end of teaching workshop with design tutors and studio coordinators. It is worth noting that many of the initial observations occurred during teaching times and these provided anecdotal evidence for the workshop structure and focus. In this way, the workshop served as a refinement of ideas more than the development of new observations. The workshop was structured as a discussion on three main points.

- What were the ongoing challenges of teaching landscape studio online?
- What online teaching techniques were most successful in the landscape studio context?
- Shared examples of student design work produced in the online studios with discussion of how these differ or compare to previous years work.

In addition, student learning experiences were reviewed via the institutional subject surveys. The name of these surveys differs among institutions, but they are run at the end of each teaching semester to understand student perspectives on individual studios and subjects. While the surveys provide a value reflection on the whole of subject experience, there are gaps in understanding the specific changes to online learning. Students are asked to reflect on factors such as the quality of learning materials and workload. For this research, this data was used to compare general student experiences against the observations of learning quality and progress made by the teaching staff. For example, tutor observations of student engagement and progress were compared against student rankings of engagement with the subject material. These comparisons helped with understanding the changing dynamics in the studio environment and how students were also adapting their expectations of learning design in new formats. The outputs from these data were then applied against general theories of adult learning.

3 HYPER-CONNECTION AND MOTIVATION IN ISOLATION

While there are obvious changes in the way content is delivered online, the move to remote learning also greatly impacted the dynamics of interactions between students and their peers and teachers. The interconnected changes in the studio learning environment, content and relationships have revealed novel outcomes in both design work and teaching methods. These outcomes suggest the need for a closer examination of the role of these interactions in different aspects of studio-based pedagogy. To maximise these novelties requires greater articulation of how learning interactions are managed, with considerable repercussions on how core design methods and techniques are taught, understood, and applied.

Specifically, how to better create and choreograph independent and collective applications of student-to-instructor and peer-to-peer learning in different studio environments. Furthermore, how the principles of design-driven teaching and learning might engage with pedagogical theories such as andragogy, alongside learning and support mechanisms for students, such as Self-Determination Theory.

For design-based studio teaching, the distinct change in online teaching begins with the instructor's role of facilitating interaction and demonstrating skills, further leading to how students collaborate and interact together. Fundamentally students learning online are not isolated. In the online environment, students have access to more layers of communication, feedback, and expression than ever before. While the noise and chatter of a studio environment cannot be replicated online, it is important to recognise where and how students already operate in the wider network of online social, formal and technical online environments (Dreamson, 2020).

One of the critical changes to university level learning in moving from the classroom to online is the necessary introduction of andragogical methods of learning with the more common pedagogical practices. In pedagogy, the emphasis is on the instructor to deliver content, performing the role of expert while assuming the learner has limited self-directed learning skills. Whereas in distance learning, the natural mentoring role of 'checking in' and redirecting student work is diminished, instead replaced by large periods of time in which the student is left to themselves. It is here that principles of adult learning are most useful. The adult learning theory of andragogy shifts more responsibility to the learner, making a presumption that the student brings motivation and are therefore able to self-direct their learning (Cercone, 2008; Ferreira & MacLean, 2017). The move to online learning necessitates students take ownership of their learning space and activities, but equally requires the instructor to give agency and provide trust in the students' capacity to do this. This begins to redefine the role of the instructor as one of facilitator, someone who supports and encourages dialogue, rather than demanding action and interaction (Ferreira & MacLean, 2017; Knowles et al., 2014). As an adjunct to this, a further key assumption of an andragogical approach is that the student be encouraged to put more of their lived experience into their work, as a means of intrinsic motivation and further to promote self-confidence. While studio-based learning encourages creativity in design response, an andragogical approach further extends towards encouraging student interpretations of design methodology and style of communication. By encouraging students to utilise existing experience and knowledge, the learning approach emphasises unique responses to design tasks and techniques.

While one perceived benefit of a traditional classroom structure is that increased motivation and boosted student confidence comes from being in a collaborative learning environment. In the switch of design studio to online it was evident that students would need to maintain levels of self-motivation over the semester with less input from the classroom environment, their peers, and their instructor. The task of maintaining motivation was complicated by the COVID19 situation and the fact that students were limited in their ability to interact with other people outside the classroom for much of the teaching year. In the absence of extrinsic sources of motivation from a collaborative physical environment meant motivation strategies need to resonate at an individual level. Adult learning theory suggests that motivation is intrinsic, where managing motivation becomes as much about limiting demotivation as about inspiring greater motivation (Vollet et al., 2017). Self-determination theory, a macro theory of human motivation, indicates three factors to be cognisant of in maintaining motivation (Huxley-Binns & Ferris, 2013, Chen & Jang, 2010, Skinner et al, 2017):

- A person's sense of their competence in being able to complete a task. In an online studio the design of tasks that were achievable for each student, intellectually stimulating while also complex enough to prove challenging.
- Connection to the subject cohort and a feeling of belonging to that group. In an online studio, where students were limited in their ability to form connections with other students, the structuring of the subject such that interactions were driven by the tutors and maintained by frequent collisions of students with one another.
- The autonomy to make one's own decisions within the context of the tasks that are set. In an online studio an especially important method of motivation that concedes choice of method or response to the student in a way that empowers them to use their strengths to produce stronger work.

3.1 Moving the physical studio into the virtual world

In landscape design teaching, some factors remain pillars of both an online and face-to-face design studio. For example, designing outdoor environments, responding to a site, and engaging with design theory and methods. Teaching these skills in a physical design studio aligns with well-developed landscape theories and generative methods. However, the altered means of interaction in a remote learning environment begins to affect how design methods and techniques are understood interpreted by students working remotely and in isolation. These changes are strikingly highlighted through the comparison of two core landscape skills, physical and digital landform model making.

3.2 Demonstrating design tools: physical & digital landform modelling

Without the physical space of the studio, physical landform model making was shifted to student's homes. The task of generatively modelling a landform using clay, which had previously been taught physically in class with a tutor and specific guidance on using tools, working to scale and feedback on form. However, with various lock down restrictions, many students could not access clay. Subsequently, while the core task of generating landform remained, students were given more freedom and encouraged to experiment with materials they could access. In addition, much of the instruction was switched to pre-recorded videos that aimed to illustrate the concepts of scaled topographic manipulation and landscape theory rather than just providing an online 'how to" guide. In response, students utilised homemade play dough, cloth, screws (Figure 1) and repurposed materials to the task of generating landform and understanding the human scale within the abstract model space. By pairing agency with appropriate design theory that explained and illustrated generative techniques, students took more risks than those previously working in the physical studio space. Predictably these risks were also encouraged by more variable home environments, alongside constrained material palettes.

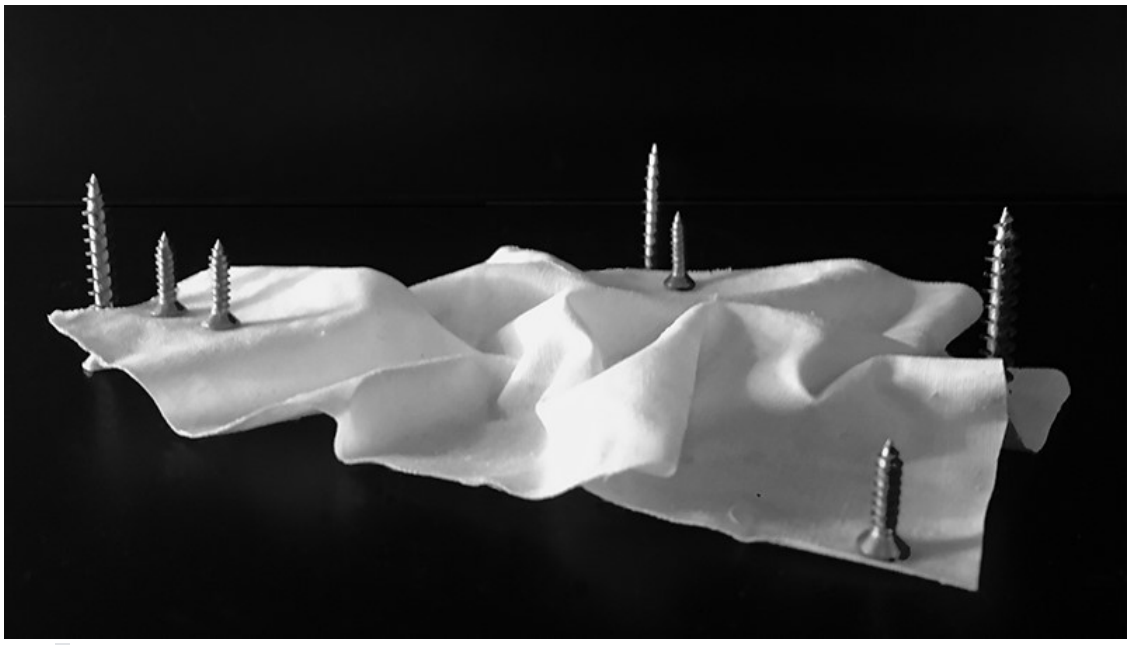


Figure 1. Early stage design exploration of landform surface generation and human scale using repurposed materials. Author Melissa Rowland

Although the use of varied physical materials is not itself innovative, the scavenge and hunt element of working with what could be found provoked enthusiasm in the students and led them to explore and interrogate the task far more than usual at this stage of learning. Further, the diversity of student approaches – from material to technique and landform design – informed a productive online class discussion about form and idea generation. Notably, students felt confident in drawing on their own independent ideas and knowledge to complete the task. Even though the instructional videos demonstrated modelling concepts such as working with scale, the students were able to translate those ideas. In this instance, the autonomy

of the working environment was effective for creating a richer outcome across the studio group. This outcome was a stark contrast to similar principles applied to teaching digital modelling skills.

Landform generation in a digital model space is a powerful medium for landscape designers, however, for early-stage learners, the creation of form can be influenced by the ease of using specific elements of the tool. As Andrea Hansen (2011) suggests, different software capabilities directly influence form making. As students learn to master digital modelling it is easy to succumb to the ease of making flat planes and terracing, rather than pursue more intentional or complex forms. While 3D modelling software such as Rhino, 3D Studio Max, Maya and many others can create form in multiple ways, the technical competence required to follow designer's intentions often necessitates a broad range of technical skills to achieve a desired outcome. The collegial space of the physical studio lab is valuable for sharing such abilities across the group. Students often exchange tips and tricks, and tutors can address specific problems and identify consistent problems across the group and breakthroughs can be highlighted in real time conversations. These forms of interaction are the basis of 'studio culture' as previously discussed. That fluid and easy exchange of technical knowledge which enables new students to rapidly improve their digital modelling skills is very difficult to replicate online. Furthermore, when students are removed from the physical studio space for learning digital skills, the divide between those with previous digital tool experience very quickly separates the progress of the student group. Those with some pre-existing digital experience can progress, whereas those with little experience can quickly become lost or frustrated. For the isolated student, asking a question might require joining a discussion forum, emailing their tutor, or independently researching an answer. Each of these forms a stop in the actual activity of modelling, slowing down progress and flow. Even in live studio Zoom sessions, there can be a considerable delay in explaining a problem, sharing a screen, or switching interfaces. When students encounter technical difficulties, working in isolation both slows down the progress and the learning of some students and further shelters them from pushing through design hurdles. Students express frustration with controlling the tools they are expected to use. For example, Figure 2 shows the early stages of learning to use Rhino 3D as a modelling tool for topographic design where the student struggled to gain control over the shape and scale of the intervention. In these instances, motivation becomes difficult to maintain if the design tasks are too difficult at an individual level, as the student's existing skillset and belief in their ability to complete tasks is challenged.

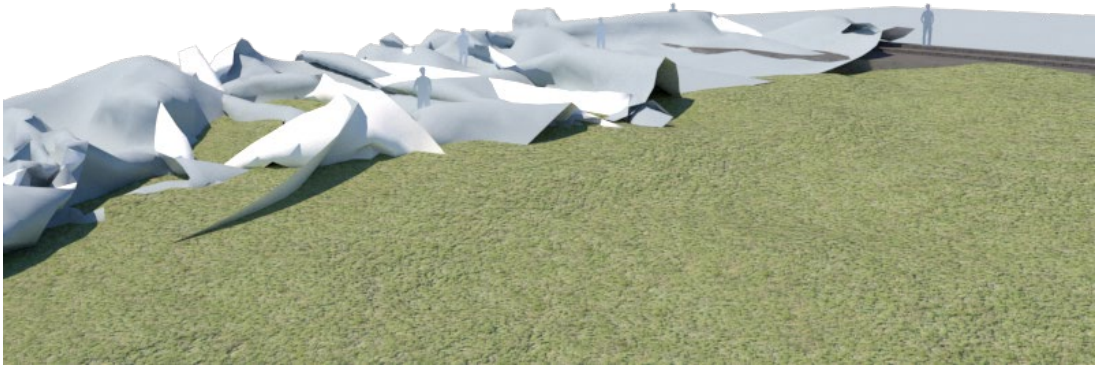


Figure 2. Early stage topographic explorations incorporating and technical skills development in Rhino 3D. (Anonymous)

Whereas physical model making in isolation became a pathway to interesting and unforeseen form-making, digital model-making became reductive to the most basic software commands. Creating the productive studio environment of sharing skills and techniques for technically complex tasks posed a different learning challenge to the more open-ended processes. The loss of this shared occupation of the

classroom impacted the methodological framework for interactions within the studio dynamic in two ways. In the first instance, it reveals the particularities of the instructor relationship to the individual and the collective student cohort. Secondly, distance fundamentally alters the dynamics of peer interaction required to support a group working at varied skill levels, generate ideation and reinforce culture essential to professional life beyond study. These simple observations in the differences between studio space, task, autonomy, confidence, and social connection became critical to the further structuring of online studios and facilitating studio interactions and dynamics.

4 FACILITATING STUDIO DYNAMICS

The loss of the physical architecture of the studio teaching space – the shared occupation of a room with surfaces for display – forced new tactics to be explored. There are numerous options for online sharing and collaboration, however for studio-based teaching simulating the wall requires a particular set of functions within the disembodied virtual space. Students need to share work, receive feedback as well as view and critique other work from within the cohort. However, simply providing a virtual wall does not create the same social and personal interactions that create studio learning culture. In addition to viewing work, students also need to trust in the group, feel connected and understand the value of cohort feedback and critique.

To create opportunity for interconnection and trust between students, small group structures were maintained to encourage student-to-student interaction, as well as to ensure an equity of feedback and attention. In the initial move to online studio, students would log in for their group consultation and share their screen to receive feedback from the instructor. However, while useful, this method alone was an unsatisfactory way of managing student interaction and cohort dynamics. The continued division of the cohort into small discrete groups had the effect of siloing students from the larger peer group, with students limited in their agency and not able to create connections to or benefit from feedback to and from a larger critical mass of voices. This approach also mirrored the inefficiencies commonly experienced with the ‘one-on-one’ method of in-class teaching, where instructors repeat feedback.

A new approach was required to enable cohesion within a larger group of students. The design studio wall provides the benefits of bringing together the cohort whilst allowing emphasis on a single work at a time. This positions individual work amongst a reassuring collection of peer works that provides an assemblage of intellectual cues and ideas. The wall, operating as a panacea to the sense of being singled out, spatially motivates both intrinsically and extrinsically. To mimic the lost wall of the design studio space, the platform Mural was used to enable visual collaboration in a cohort-based environment (Figure 3).



Figure 3. A studio Mural board from semester 1 2020, showing students cumulative and iterative progress through the semester.

The virtual space of Mural mirrored the pinup wall of the design studio, enabling work to be uploaded to a shared page and dynamically annotated using direct-drawing and text-based tools. This provided the ability for teaching staff to drive the focal points of discussion, with students following the tutors screen or the screen of others and resulted in a shared field of view. In this form, earlier discussion points could be more easily revisited - in direct reference to other student work. This clarity created points of interaction, in which the overlap between one student's work and another provoked direct response. Students, more directly involved in the discussions, paid closer attention to each other's work, often making pointed and direct comments about their own work in relationship to the projects of others. This created a generous atmosphere for the sharing of ideas and fostered a much stronger sense of collegial competition.

A hybrid model of the online wall and group structure was also explored, in which students shared work in small groups and alternately larger class-based dynamics was established. This was particularly effective for intensive full day studios, which more closely mirrored a 'real' studio working day. Within a single collective session, class was broken into three groups of students on the Mural digital workspace. Students would pin-up at start of session, set their own goals for the day and then returning to review at the end of the day. Students reported that they enjoyed listening to feedback from other students while they continued to work on their own drawings, feeling that less time was wasted but also that they were able to maintain the sense of being part of a cohort.

For instructors, the Mural wall made it possible to pinpoint students who required additional support and engagement or a change to scheduled checking in that can be either too much or too little depending upon the student. The instructor could leave comments, annotations, and suggestions directly to individual students that were visible to the whole cohort. This surreptitiously led spontaneous live exchanges between students and tutors through a series of post-its, drawings, and comments (Figure 4). Similarly, the instructor could directly mark-up conventional drawings to explain spatial and material concepts, reinstating some of the haptic qualities of face-to-face design studios. This collaborative experience was emphasised in the ways a studio leader could visually link precedent into the student's process (Figure 5).

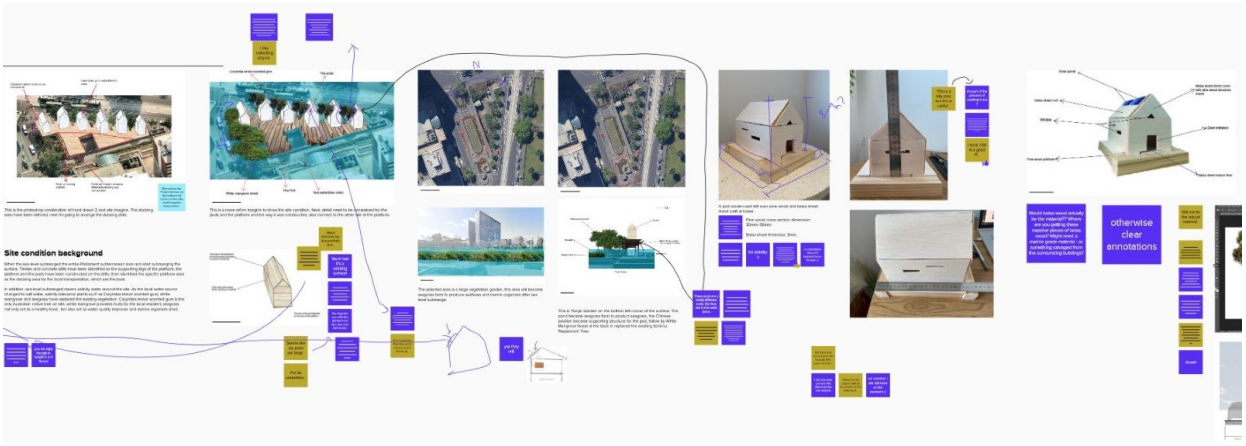


Figure 4. Dynamic interactions between student and tutor. Author: Remy Yuchen Shi

While there was some success in creating tutor-led feedback and discussions using Mural boards, generating dynamic student-to-student responses was harder to replicate. In addition to creating 'space' to share work, creating connections and feedback in the digital required more direct approach to facilitating student's critical connection to the group. To manufacture that shared feeling of connection, tutors used two types of curated interactions – text-based and verbal.

In the text-based approach students were required to post their work and to comment on at least one other student's work, using virtual post-it notes or comments. This approach was useful in bringing students directly into discussions and gave students the ability to reply to one another. As dialogue unfolded over time, students had a chance to consider and respond to the peer critique.

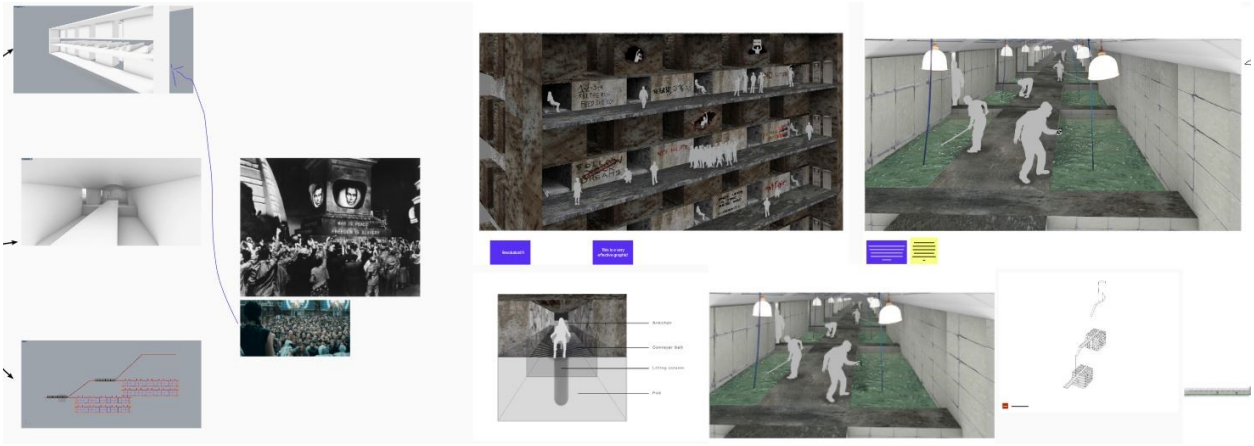


Figure 5. Activated precedents. A filmic/literary reference (George Orwell's 1984) was translated by the student as a dystopian turn to the speculative narrative design output Author: Bonnie Zhang

The verbal approach used the breakout room functionality of Zoom in combination with the mural boards. To initiate conversation, the tutors didactically set a particular focus for each breakout room discussion. Students frequently had opportunity to speak, both to the entire group and to the break-out room. Over time, as trust within the group developed, students more frequently annotated and commented on each other's work. In addition, the breakout conversation often spilt into the larger room as the students had the opportunity to continue to speak to the suggestions made by their peers.

Keeping in mind the need to manufacture connections and maintain student motivation, tutors were involved actively in facilitating the discussion sessions without leading them. Tutors were challenged to facilitate social interactions as well as provide design feedback. It is far easier to observe and work with social outliers in a classroom than it is in the digital void space. In some cases, instructors entered virtual rooms where the discussion had stonewalled whereas elsewhere, discussion was lively, and ran on beyond allocated time constraints. Initially randomly assigned, curation of the groups by tutors was necessary to best address the range of social confidence in the cohort.

5 DISCUSSION

While the techniques discussed here have been taught extensively in design studios in face-to-face settings, the move to online transformed both studio outcomes and the processes of delivering content. Many of the techniques applied in the revised online studios were developed as iterations of regular teaching methods. However, they had not been tested as online techniques. The outcomes highlight that there are clearly moments for strategically combining students to provide impetus and energy for motivation and for forcing them apart at times when students can drive their own learning. At the level of master's design teaching, students can confidently be positioned as adult learners in most contexts, but even the most motivated of students need the input of their cohort to maintain their learning momentum. The social aspect of studio learning requires a balance of adult learning, such as utilising existing skills and knowledge alongside the curation of peer and tutor interactions.

Overall, the shift to online design studios has fundamentally changes the role of studio teacher as facilitator and curator of such interaction. 2020 has produced a new type of disembodied studio where instructors have learned to become drivers of technology, provide social structure and mediation concurrent to the core role of proving design feedback and review. The shift also forced the instructor to be more acutely observant of the voices in our ears. It became our duty of care to ensure students did not become further isolated – from the studio itself, from their peers and from us as their guides in this space. There is no one size fits all approach to student engagement, as is evidenced in the attempts to create class connection in Zoom, shared screens, breakout rooms and Mural boards, a system that worked well but not always.

The nature of these interactions, and the independent or collective nature of how students are asked to work, greatly influences the outcomes of teaching design techniques and methods. For example, occupying the same physical space enables peer technical support and collective problem solving, however online environments struggle to reproduce this dynamic. While question and answer forums and sessions go some way to addressing this, they are time consuming and cumbersome. For instructors, it becomes difficult to diagnose gaps in individual and group technical knowledge which would be more readily identified in the classroom.

The hybrid system of interfaces alongside the dislocation from face-to-face feedback requires a new mindset from instructors. As we have seen, the lack of physical presence and interactions challenges traditional ideas of how the design tutor guides students. While students still require feedback and guidance the social conditions of online learning need to prioritise student engagement with the tasks and learning objectives that are separate from their interactions with the design tutor or instructor. This suggests a shift in attitude away from the instructor as the owner or bearer of all knowledge towards more purposefully enabling student-led learning and enquiry. At the larger scale, studio sequences need to be constructed in ways where the instructor becomes secondary to the learning processes. In addition, at the more immediate scale, instructors need the presence of mind to recognise that students can be reluctant in their interactions and tasks and need help to move forward, to be shuffled around in some cases to facilitate conversation directly.

5.1 Curating the student experience.

For many students, studio learning shifted from a collective learning experience to a more isolated and individual experience. However, this is not universally negative. For example, the outcomes of the physical modelling were surprising and sometimes non-conventional, and these offered unique insights. The unexpected forms proved very useful for students in advancing their design rapidly. The success of the physical modelling as an independent task can be contrasted clearly when compared to the more technically challenging task of learning 3D digital modelling. Introducing digital tools produced a surprisingly limited range of outcomes. The technical acquisition of software skills to enable the students to engage in 3D modelling was tough individually. It resulted in more formally homogenised outputs. As opposed to the creativity the students exhibited in physical modelling techniques, some in the cohort became increasingly reluctant to expand their repertoire, becoming increasingly risk averse in their design exploration. As such, in technical tasks that required new skills, the aspiration of using tools to push design outcomes needed to be scaled back in terms of scope. In contrast, in cohorts with existing digital skills that did not require an introduction to technical software, a different outcome was observed. Class time was instead curated around focused formal exploration. This produced far more diverse outcomes, more closely mirroring the products of the physical modelling. The variance in outcomes between tasks performed online and expectations of those same tasks in a face-to-face studio offer useful observations for the pedagogical and andragogical framings of future landscape studios.

It is evident that some tasks, like physical model making, can be trusted to students with a high degree of autonomy. But that others, such as the digital skills module, where base level skills are lacking still require an instructor-led pedagogical approach to control how techniques are conveyed. In the any design studio environment, balancing these qualities is important for building confidence in new designers, where the nature of the work is highly variable, often process-based and contextual. The juxtaposition of these parts of the curriculum might not be surprising but nonetheless are a lesson in being cognisant of the outcomes we wish to achieve when we teach, the medium we are able to use and the skill level of each cohort.

Fostering motivation can occur from both intrinsic and extrinsic influences. Furthermore, maintaining individual momentum over a semester extends beyond consistent instructor feedback to towards driving student interactions with each other in an effort to encourage peer learning and model group cohesion, a task that is less akin to the instructor who brings technical knowledge and design skills, and more akin to a facilitator or manager of people. These observations illustrate Dreamson's (2020, p. 490) argument for connective engagement, where 'multiple identities emerge from the spaces between connections where individuals' engagement in the networked world are sustained in the learning community.' While there are new impositions on both learner and instructor in the online teaching environment, these dynamics can be managed, potentially with very good teaching and learning outcomes. Combinations of online and face to face learning might be harnessed for future studio development. Some of the things to be considered are:

- Drawing on online studio as a mode better suited to slower interactions such as mulling over mural boards and posting responses.
- Allocating time to individual work in isolation, with consideration of intrinsic motivation and lived experience may produce unexpected outcomes.
- Regardless of teaching mode, teaching technical skills needs to be heavily supported if rapid progress quickly is required, curated on tightly programmed focused outputs.

6 CONCLUSION

The education sector was not alone within the broader design community grappling with the quandary of losing collaborative and shared workspace. Professional design studios in the Landscape Architecture faced an identical loss of a workspace-based culture, where the process of production are heavily predicated on the common occupation of the office (Stewart, 2020). There is a natural connection between how we teach design and how it is practiced. As workplaces transition to more instances of working from home, methods of collaboration will inevitably evolve. The next generation of students will need to understand what studio culture means in both an online and face to face context. This is a skill set that extends beyond technical aspects into the social dimension of practicing design. The large-scale transition to completely online learning has revealed the many of these overlaps between design techniques, environment, and interactions. These include the form of feedback and interaction and the complex modalities of design communication in support of conventional studio outcomes. Specifically, how modes of isolation and connectivity greatly influence student interactions, attitudes, and outcomes of the design studio. Across these examples, the successes and failures of the rapid shift to online studio delivery offer important insights into reviewing the pedagogical approaches of design studio learning and further, provide lessons for the future of both face to face and online design studios.

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