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Dual Delivery Design Studios: Exploring Design Learning for Hybrid Cohorts

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Abstract

In the wake of 2020's move to remote learning and teaching, institutions of higher education began experimenting with approaches that combine face-to-face and online learning. This article reviews one learning and teaching group's development of guidance for "dual delivery" and reports on focus group conversations with staff coordinating dual delivery design studios. It highlights key considerations identified by the group—learner equity and access, cohort building, and staff and student perceptions—and reports on efforts to address these through the design and coordination of studio subjects. This marks the first known study exploring hybrid/dual delivery in the design studio context. Findings suggest that treating the hybrid split-cohort mode of 2021 as an amalgamation of online and blended learning approaches is to ignore its unique learning design challenges, and to underestimate the implications of dual delivery for studio teaching. In addition to specific strategies for the design of studio learning activities, teachers' "on-the-ground" reflections offer additional insights for studio coordination—on distributed, place-based learning; on peer-to-peer interaction around student work; and on approaching learning design on the premise of "contingency". The article encourages testing of new pedagogic forms that can combine learning modes across space, and engagement with activities over time, in support of rich design learning for emerging hybrid cohorts.

Keywords

design studio pedagogy, hybrid learning, dual delivery, cohort building, learner equity

Introduction

In the wake of 2020's move to remote learning and teaching, institutions of higher education around the world began experimenting with "hybrid" approaches that combine face-to-face and online learning (Laker, 2021). While this may have initially been approached as a temporary measure to accommodate varying student interest/ability to return to campus, such "dual delivery" models will nevertheless influence educational futures through shifts in practices and values. When a single subject combines two or more learning modes for groups of enrolled students (e.g. fully online and "blended" learning) multiple teaching challenges arise, not least those of providing equitable learning and community-building opportunities. Overlaid with the

trials of distributed design studios, we find ourselves in a moment of pedagogical experimentation, confronting long-held teaching traditions.

In the first part of this article, we outline one learning and teaching group's development of teacher-facing guidance in anticipation of the challenges noted above, including unpacking the "dual delivery" model. The presented literature and conceptual frameworks underpinning this approach illuminate concerns beyond those of fully blended or fully online subjects. In the second part of the article, we report on a series of focus group conversations with design studio coordinators teaching in dual delivery mode. Participants reported "on-the-ground" experiences to augment the guidance delivered and test its application. Additional considerations regarding student engagement, access to physical sites and peer-to-peer interaction across learning modes emerged for design teachers under these circumstances. These challenges were not addressed as temporary measures on the road back to pre-pandemic teaching. Rather, they presented opportunities for more considered, and considerate, approaches to student-centred design education. In addition to specific strategies for the design of studio learning activities, their reflections offer insight for studio coordination—on distributed, place-based learning; on peer-to-peer interaction around design artefacts; and towards a pedagogy that embraces "contingency".

Context

The Built Environments Learning and Teaching (BEL+T) group, within the Faculty of Architecture, Building and Planning (ABP) at The University of Melbourne, is an academic group focussed on the sustained improvement of education for built environment disciplines. Established in mid-2018, the group applies creative problem-solving and design-led approaches, evidence-based research methodologies and project-focused consultancy to improve teaching quality and student engagement. BEL+T draws from its members' diverse skillsets as designers and researchers to engage with the Faculty as the location, inspiration and beneficiary of focussed built environments learning and teaching research.

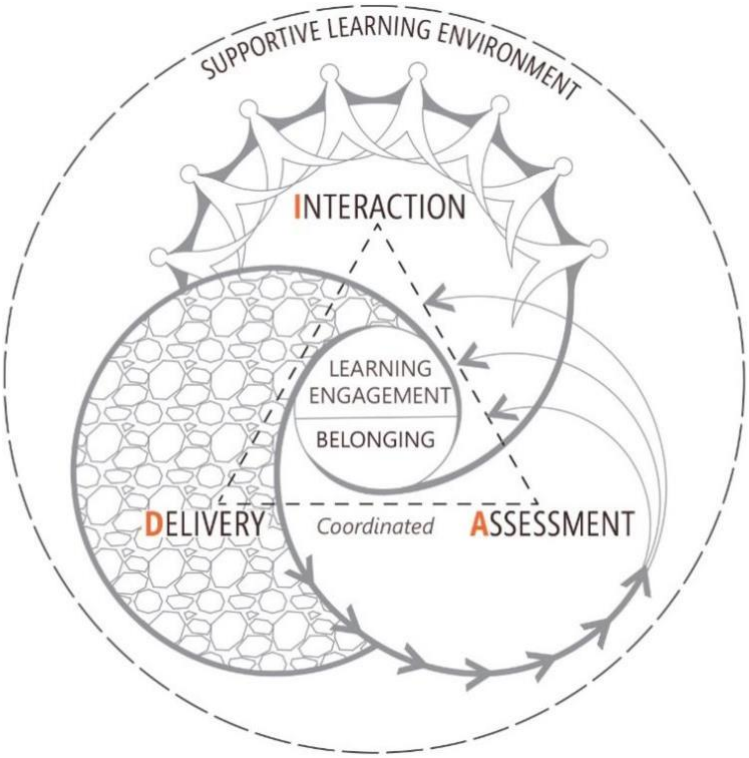

Figure 1. BEL+T's DIAgram v2.0

Throughout 2020, BEL+T's challenges included identifying ways to understand, communicate and support new needs and practices emerging from the shift to online education. The BEL+T website became a key space for sharing resources and emerging approaches, including "Guidance for Teaching Online" pages organised around BEL+T's DIA framework (see Figure 1, available at https://melbourne.figshare.com/articles/figure/BEL_T_DIAgram_v2_0/14398637?file=27629193).

For the purposes of this paper, it is helpful to briefly note the constituent elements of the relational DIA framework and its DIAgram, developed as a "learning design system" (Dalziel, 2008, p. 376) and drawing on Oliver's tripartite model for online learning design (Oliver, 1999; Oliver, 2001). Further detail of its development, testing and delivery in response to pedagogical, technical and cultural challenges of the shift to online teaching is described elsewhere (Tregloan & Thompson, 2021). The DIA centres on two paired student-focussed pedagogical aims: *learning engagement* and a sense of *belonging*. These provide focus for three of teaching's primary tasks: *Delivery* of subject content; supporting *Interaction* between students and their peers and staff; and effective *Assessment* for learning. These are presented as interrelated, and as activities needing effective *Coordination*. The significance of *Coordination* for online learning activities is also published elsewhere (Soccio et al., 2020), as is the importance of a *supportive learning environment* as an encompassing field (Thompson & Song, in press).

The DIA was applied to review over 300 ABP Faculty subject Learning Management System (LMS) sites in 2020, highlighting key pedagogical and technical challenges of the move online

and informing ongoing iterations of the approach and development of resources and tailored support. The particular qualities of design studio pedagogy were central considerations and brought specific inflections to the elements of the DIA, as explored more fully below. For most of ABP's undergraduate and postgraduate programs, design studios reside at the centre of curricula and student experience. In a given semester, the Faculty offers a host of design studios, including in Architecture, Landscape Architecture and Urban Design.

Following the tumult of 2020, continued border closures facing international and some domestic students delivered a new teaching challenge for 2021. The University of Melbourne elected to enrol students who could (and would) return to campus alongside those remaining in online learning mode, designating this "dual delivery" (see Figure 2). Forty-six subjects in the Faculty, representing 33% of the semester subject offering (60% of student subject places), were identified as dual delivery. Of these, over 50% were studio subjects.

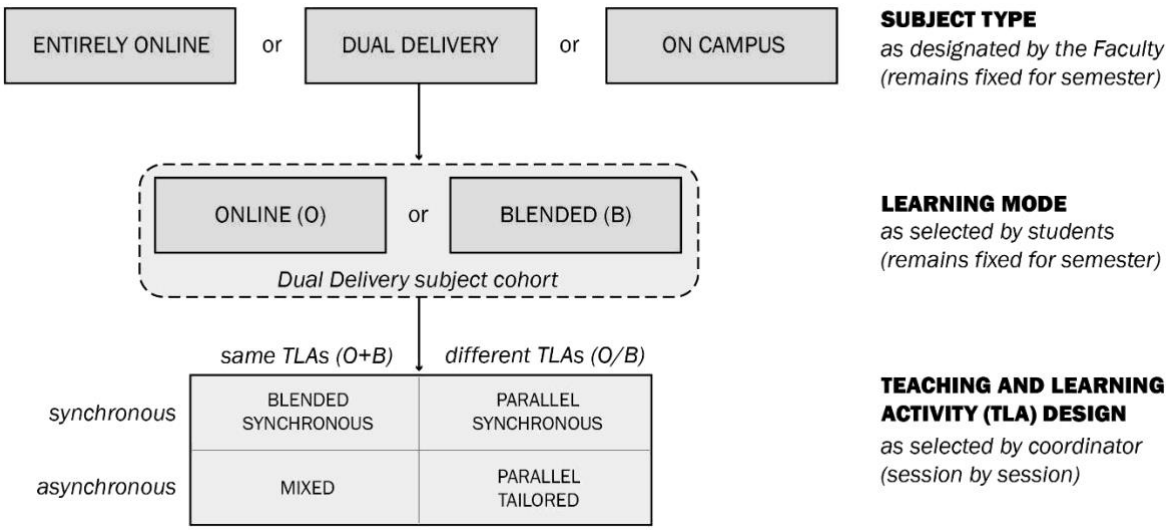

Figure 2. Subject types; Dual delivery learning modes; TLA design options

Seeking to anticipate major challenges and concerns of this new approach, the Guidance for Dual Delivery developed by BEL+T drew on lessons of 2020 and review of student feedback from that year, structured around the elements of the DIA framework (BEL+T Group, 2021). The next section provides an overview of its development.

Development of a Dual Delivery Guide

A review of scholarship relating to dual delivery, including its constituent and tangential concepts, formed the background to the resource's development. While the lack of consistent definitions and an overlap of related approaches introduced some complexity, existing education models designed for spatially distributed student cohorts offered useful perspectives. Models foregrounding student choice included the work of Beatty (2019), whose Hybrid-Flexible (HyFlex) model centres on "class sessions that allow students to choose (on a daily or weekly basis) whether to attend classes face-to-face or online, synchronously or

asynchronously" (p. 13). This approach responds to broader calls for more flexible learning models:

> *"As a result of…changes in attendance patterns and enrolment modes, universities need to find new ways to engage students in learning activities that can be effectively undertaken irrespective of their geographic location" (Bower* et al*., 2013, p. 92).*

The authors cited above also note concerns that "remote students may not be receiving an equivalent education to their on-campus counterparts" (ibid., p. 93), foreshadowing a key concern of 2021 as highlighted below. Unsurprisingly, interest in models like HyFlex surged during 2020, as institutions looked for ways to transition "back to campus". Regehr and McCahan (2020) were amongst the first to suggest how universities might operate post-COVID. They stress, as part of their proposed "Planning for Recovery and Adaptation" phase, that subjects should be offered as a:

> *"…flexible learning opportunity [that] affords an in-person experience for students who would like to engage on-campus, but also addresses the needs of students who may need to learn from home during part or all of the term." (p. 118).*

The earliest identified study to refer specifically to the term "dual delivery" compares the academic performance of on-campus and online students enrolled in the same engineering course (Enriquez, 2010). In this case, synchronous content was simultaneously delivered to on-campus students via a computer projector, and to online students via a video-conferencing software and virtual classroom. Enriquez's study is an early example of the model often called "blended synchronous learning" or BSL (see Bower et al., 2014). In general, this involves students online and on campus engaging in the same learning activities, at the same time, in a "shared" space. Elsewhere, this model is referred to as "hybrid-concurrent" (Monash, 2021), "multi-access learning environments" (Irvine, 2009) or "simultaneous instruction" (White *et al.*, 2010). It requires teaching spaces fitted with enabling technology (e.g., multiple cameras and microphones) to allow students across both learning modes to engage synchronously with the same content and activities, as well as with one another across the digital divide.

The dual delivery model adopted by The University of Melbourne called for students to nominate a preference for online or blended learning modes for each subject at semester enrolment, with subject type allocation (see Figure 2) considering student preferences. Once each student's learning mode for a given subject was confirmed, the subject type and learning mode allocation were fixed for the semester, although activities within the subject's design could vary significantly as outlined below. University guidance required that teaching and learning activities (TLAs) be designed such that all students were equally able to attain the subject's intended learning outcomes (ILOs). Aiming to support equity across the whole cohort, it was also specified that all lectures would be delivered online for all students, and that all summative assessments be undertaken online. Within this framework, BEL+T identified four TLA design types that considered activity timing and engagement by learning mode (Table 1).

Table 1. Matrix of four TLA design types

	Same TLAs (Online and Blended Modes)	**Different TLAs (Online vs Blended Modes)**
Synchronous	*Blended synchronous:* students online and on campus engage in the same learning activities, at the same time, in the same space. This approach requires teaching spaces with technology that allows students of both learning modes to engage with the same content and with one another.	*Parallel synchronous:* students online and on campus engage in different (but equivalent) learning activities at the same time.
Asynchronous	*Mixed:* students online and on campus engage in the same learning activities outside of timetabled sessions.	*Parallel tailored:* online students and those on campus engage in different (but equivalent) learning activities at a range of times (some the same, some different).

The BEL+T Guidance for Dual Delivery anticipated key concerns through the lens of the DIA framework outlined above. Following the University's guidance, it was suggested that the *Delivery* of information and learning "objects" should be asynchronous, making use of subject LMS sites as shared online spaces equally available to all. Suggestions relating to virtual site visits drew on techniques developed to offer site "experiences" to students learning remotely during 2020's lockdowns. Approaches to *Assessment* similarly focussed on ensuring parity of access, and highlighted the significance of both the quality and the quantity of feedback for learning. In such a complex model, the importance of effective planning and *Coordination* was also crucially important, including clear communication. BEL+T members, noting the tendency to use "on-campus" as a synonym for "blended", or "cohort" for "learning mode", developed a glossary to offer some consistency and avoid confusion.

While the provision of information and support for planned activities called for clarity, the DIA elements related to interpersonal relationships demanded more nuanced consideration. These are, of course, particularly significant to studio learning as understood through a "communities of practice" model (Williams, 2017). Differing learning modes imply different modes for *Interaction* between those students and teaching staff, and support for student-to-student interaction across modes and timing introduces further complexity (see Table 1). The central concerns of the DIA framework illustrated in the DIAgram (Figure 1) questioned what effective *learning engagement* would entail for students in either mode, while fostering a sense of *belonging* across modes raised perhaps the greatest challenge. Supporting all students to enjoy similar opportunities to connect with peers and wider academic/professional communities suggested more direct involvement by teaching staff. Particularly in stressful times, a *supportive learning environment* asked staff to balance intended learning challenges with suitable support, and to recognise emerging differentials across mode and individual circumstances.

In parallel to review of scholarship and institutional advice, student perspectives informed the guidance produced. Review of 2020 surveys and teaching award nominations were sorted and analysed from both on-campus and online experiences through the lens of the dual delivery model, identifying key themes to student values and concerns. This allowed a shift towards the specific disciplinary concerns of built environments and design education, and student perspectives that could inform dual delivery approaches. Key considerations were identified in relation to equity, belonging and communication (see Table 2), as further detailed below.

Table 2. BEL+T's Key Considerations for Dual Delivery

Learner Equity and Access:

- providing all students with equivalent opportunities and support to achieve a subject's intended learning outcomes;
- allowing for differences in learning modes, and the opportunities or challenges (e.g. digital access) they present, when preparing and reviewing student activities

Cohort Building:

- offering informal and formal activities for all students to develop a sense of belonging and to identify as a collective learning community;
- considering how students in each learning mode can contribute and participate most effectively to the activities of the whole cohort (avoiding either group becoming an "audience").

Staff and Student Perceptions:

- transparently communicating dual delivery subject design and the role of learning activities for students in each learning mode;
- using consistent language (a glossary was provided) to help students who may be enrolled in a number of learning modes across subjects.

These key considerations framed much of the studio teaching focus group discussions at the core of this study, as outlined next.

Design Studio Coordination: Framing of Focus Groups

The BEL+T Guidance for Dual Delivery was made available to staff online and through LMS site consultations prior to the first semester of the model's existence. Midway through semester, dual delivery studio coordinators were invited to a series of facilitated conversations. This activity was covered by Human Research Ethics Committee approval. These discussions explored whether BEL+T's identified key considerations (see Table 2) were influencing particular pedagogical demands of design studios. Discussions via Zoom were recorded and transcribed verbatim before independent review by four members of BEL+T to identify themes, subsequently confirmed by consensus.

Invited participants were selected to represent a cross-section of dual delivery design studios across both undergraduate and postgraduate levels, plus a discipline mix including Architecture,

Landscape Architecture, Graphic and Performance Design. Studio subjects led by participants ranged in size from 17 to over 200 students, bringing an array of scale-related coordination challenges, as well as differing levels of student contact. For subjects with smaller enrolments, a coordinator typically led a studio group in either blended or online mode. Coordinators of subjects with larger enrolments, in contrast, managed a team of tutors (mainly sessional staff working in local practices) with limited participation themselves in direct studio teaching. Typically, studio subjects in the Faculty include 16 students with one or two tutors. Large studio subject enrollments are divided into studio sections of similar scale. Studio timetabling is typically distributed throughout the week allowing for individual student study plans and flexible use of learning spaces.

While focus group participants had extensive experience of on-campus studio teaching, like most teachers, their pre-2020 experience of online teaching or related scholarship was limited. Case studies of virtual and/or blended design studios have suggested the potential for promoting learner flexibility (Bender & Vredevoogd, 2006; Fleischmann, 2018); "networked" collaboration and connectivity (Ioannou, 2018); community engagement (*ibid.)* and fruitful cross-cultural exchange (Hou & Kang, 2006). Other scholars have posited that these affordances align with emerging skills and expectations of professional design practice (Pektaş, 2015), and also that potentially "flat hierarchies" of virtual learning environments (Schnabel & Ham, 2012) might challenge problematic power dynamics of conventional studio pedagogy (see Dutton, 1989). Nevertheless, leading up to 2020, scepticism that design subjects—namely their dialogical practices and studio critique events—could be delivered fully online remained widespread amongst the academic community (Fleischmann, 2019, p. 12).

From this position of general scepticism, the 2020 shift to "emergency remote education" (Green *et al.*, 2020), prompted a wide range of emotional responses (Brown, 2020). Students expressed appreciation of the increased flexibility and autonomy, while lamenting the loss of unmediated social encounters and access to specialist tools and resources (Marshalsey & Sclater, 2020). It became clear that:

> *"Moving assessment and engagement to online formats has consequences for practice-based art and design courses: distributed learning changes how we teach and learn" (ibid., p. 826).*

Beyond 2020's shift to online studio teaching, treating the hybrid split-cohort mode of 2021 as an amalgamation of online and blended learning approaches is to ignore its unique learning design challenges, and to underestimate the implications of dual delivery for studio teaching. While we have reported on related scholarship above, to our knowledge, the specifics of this challenge have not been studied or previously published. Nonetheless, institutions are seeking ways to teach both online and blended or on-campus student cohorts jointly and effectively. The focus group discussions exploring implications of dual delivery for design studio coordination offer further lessons across the identified themes reported below.

Focus Group Outcomes

Testing Dual Delivery Guidance Against Studio Coordinator Experience

Learner Equity and Access

The key considerations around learner equity and access (Table 2) centered on TLA design to devise "equivalent" opportunities for all students to achieve subject ILOs. Generally, participants described their approach towards student equity as: a) asynchronous *delivery* of a shared set of resources and *assessment* information through the LMS, with optional online synchronous Q&A sessions; and b) offering opportunities for large-scale asynchronous "mixed" events supporting *interaction*, while identifying studio sections for either online or blended modes, with an accompanying suite of virtual platforms. As one coordinator of a large subject described:

> *"On our [LMS] site, we've got what we're calling the studio [section] portals, and within each portal they have a Zoom link, a OneDrive link, an at.studio link and a Miro link. We consciously set that up exactly the same, regardless of the teaching modality."*

Some participants noted differences of engagement on virtual platforms by learning mode, however. One observed that the students participating in online mode used the cohort-wide whiteboard platform more consistently, whereas another described a lack of engagement amongst online-only students. This engagement differential is significant for learner equity in professional training, such as architectural education, in which personal and emotional investment has substantial overlap with an individual's learning (Shulman, 2005). At the same time, individual student differences are regularly navigated by design teachers. Indeed, scholarship notes how the nature of the design process itself suggests each student will take their own path to achieve subject ILOs. As Boling *et al.* (2020) contend:

> *"Students can legitimately, not erroneously, differ in the clusters of activities they use to approach and complete their designs" (p. 1875).*

The (significant) challenge for design teachers in this regard is to offer equitable support opportunities across modes that can be tailored for individual student needs.

Cohort Building

BEL+T's dual delivery guidance identified subject-wide cohort building as another key consideration (see Table 2). This was primarily concerned with the potential isolation or exclusion of online-only learners. Across disciplines, *belonging* to a learning community is critical to academic success, wellbeing and retention (Araújo *et al.,* 2014). In studio education contexts belonging has been identified as a key element of occupational identity development, with individuals situating themselves and forming "identity horizons" in relation to their peers (Thompson, 2019, pp. 74-77). Likewise, design students value peer relationships for supporting their progress and persistence (Smith, 2015, p. 86), with collaborative design projects having been shown to contribute to wellbeing and personal growth (Thompson, 2016). Questions have been raised, however, regarding how such benefits translate to online learning environments: "How does a class form *collegial bonds of interaction* that may naturally and easily develop in a regular semester studio class?" (Gajendar, 2017, emphasis in original).

Participants described ways they designed assessment-related activities to promote belonging:

> *"Students had to produce a small design piece and put it up onto the discussion board and then give feedback on other students' work … in class time but also through the week ... So that was a really nice activity getting students to bond, talk to each other, find out who each other is …"*

As in this account, such bonding was most likely to occur within a single studio section—and therefore often within a single learning mode. As teachers ostensibly entered 2021 experienced in implementing cohort-building strategies for fully on-campus and fully-online semesters, participants noted that fostering a sense of community *within* a studio section of roughly 16 students was not particularly challenging. One even expressed concern that each section might be *too* tight a community.

Facilitating *interaction* across an entire subject cohort was described as much more challenging, however. Approaches differed based on enrollment sizes of subjects. The timetabling of larger subjects meant that subject-wide cohort-building activities would likely need to be asynchronous. Participants noted that cohort-wide *delivery* of content, including guest lectures, provided a shared experience, and online platforms were also designed to allow student interaction across sections/modes:

> *"Regardless if the studio is conducted, let's say, face-to-face or online, every student needs to have their work online in the Miro board so that every student has access to every section's work and they can, in a way, feel more connected to the field."*

For subjects with smaller enrolments, participants described attempts to employ BSL. One subject with two studio sections, one in each mode, arranged the timetabling such that the two sections overlapped. This was one of the few attempts described to support cohort-wide synchronous interaction.

The most deliberately "engineered" example of subject-wide cohort building reported was the coordination of a collaborative design project for one of the larger subjects in the study. Students were asked to develop personas to serve as each other's clients, with a restriction that no student could pair with another student from their own studio section. This prompted asynchronous communication between students across the cohort:

> *"So we would have students outside the studio [section] acting as imaginary residents on an architectural project ... So that's the moment we really invited communication between students, and it is about developing a studio culture, critical thinking, where students interact with each other's projects and give each other suggestions, how to improve their work."*

However, as this pairing process was conducted through anonymous questionnaires, designers and "clients" may or may not cross learning modes.

Staff and Student Perceptions

The third key consideration reflected particular challenges of subject *coordination* around consistent and clear communication (see Table 2). This emerged from a prior study by BEL+T that examined *coordination* in relation to student perception of good teaching in the ABP Faculty, resulting in five characteristics of well-coordinated subjects: structured, cohesive, consistent, organised and clear (Soccio et al., 2020). So while this challenge is not unique to the dual delivery mode, the co-presence of two learning modes offers a new twist. Prior strategies for managing communication across studio sections—such as using clear and consistent language for assessment-related content—could be translated to dual delivery. Participants described "dropping into" studio sections across learning modes to "check-in" and offer a single, cohort-wide point of contact. Likewise, gauging student engagement on virtual platforms allowed coordinators to identify potential discrepancies in tutor messaging, as described by one participant of a large studio:

> *"In the first week, we noticed that the face-to-face students were not making the use of Miro board that was expected. But it's actually a requirement by the studio in the course outline. We raised this with the tutors and sent weekly reminders of what they need to be looking into…or keeping an eye on, deliverables that are expected that week, specific criteria…"*

LMS sites became the place where educators demonstrated to students transparent and consistent communication, as described by one participant:

> *"We…have a weekly announcement sent out at the end of the week: 'This is what we covered, this is what to do for next week.' And we make a fun little video. So it kind of brings together everyone, hopefully, to this one space."*

For the exercise in which students paired across studio sections as designers and "clients", the coordinator shared with fellow focus group participants a set of diagrams illustrating the various scales of interaction facilitated through the approach: within studio sections, between studio sections and across the entire cohort. These diagrams were presented to students early in semester to provide clarity and visual language for the learning collaborations they would experience.

Three Revelations that Emerged through Transcript Analysis

Spatial/place-based Remote Learning

Dual delivery highlights the design and adaptation of assessment tasks in response to the learning contexts of spatially distributed students. This challenge emerged most clearly in place-based learning activities, the one clear example that resulted in a "parallel tailored" approach to TLAs amongst study participants. Focus groups reflected on how the move to entirely remote learning in 2020, together with local lockdown restrictions, prompted the development of virtual tours as visits to (typically local) sites. This marked a significant challenge for built environment disciplines, whose design studios typically respond to real spaces, growing foundational skills in the analysis of site features to inform responsive design proposals. Furthermore, site analysis is often conducted in groups, aimed "to help students deal collectively with large amounts of information in a short period of time" (Greenop, 2021).

For one coordinator of a smaller studio subject, site visits in the dual delivery context became an opportunity for student *interaction* across learning modes, despite geographic dislocation. Students who could visit project sites in Melbourne were encouraged to act as "surrogates", obtaining spatial information and data for those who could not. They took their peers on site visits via video-messaging apps on their phones, allowing the geographically remote student to participate synchronously. While this required navigation of time-zone differences, support for cohort-wide connection was noteworthy, and offered one of the few examples of BSL (without tutors present).

Several participants suggested *delivery* of digital site data addressed equity across learning modes, regardless of whether a student accessed the physical site in Melbourne. For one participating coordinator of a subject with roughly 50 students, concerns for site access prompted development of a parallel tailored approach. The redesigned *assessment* task required students who could not access the target site to conduct a precedent study on a site accessible to them of the same building type. Each student's research—of a precedent in another cultural and geographic location or of the studio's target site—contributed to the studio's shared knowledge base. In "redistributing intelligence" (Pektaş, 2015), the importance of student site access was mediated.

Notably, concerns surrounding site access exposed disconnects between individual students' chosen learning modes and their location. A significant number of students selecting online learning were evidently located within the metropolitan area of Melbourne and could therefore ostensibly access local sites. This reflects Fleischmann's (2018) survey of design students at an Australian university, in which 3 of the 40 respondents (7.5%) claimed to prefer an entirely online mode of learning when offered a choice between that and fully face-to-face and/or blended.

While the final outcomes of dual delivery studios are not available at the time of writing, one participant noted: "We've actually had some really surprising and beautiful results from students working in isolation". Certainly, the design work produced by students learning online in 2020 was of high quality. The Faculty's end-of-semester exhibitions were also relocated to an online portal in that year and showcased a growing engagement with platforms for personal design explorations, as well as creative collaborations over distance.

Peer-to-peer interaction around design artefacts

While the prototypical image of design studio remains a learning environment with permanent desks and the accumulated flotsam of student work, studios in many contemporary institutions operate as "hot-desking" environments in which students occupy a space for their timetabled session only. In our Faculty, studio sessions are distributed throughout the week to accommodate large cohorts of students. Thus, concerns regarding how, and how often, students might encounter and engage with each other's design process and artefacts existed before the 2020 move online.

As above, focus group participants noted that online whiteboard platforms, such as Miro, offered a lasting repository for student work, or "unlimited exposure to peer progress" (see Güler, 2015):

> *"Our timetable is broken down ... so it's very hard for [students] to go from one room to the other to see work of their peers. [But within the virtual environment] they have all these platforms by which they can connect and all the tools that we have in place."*

Such platforms facilitate both synchronous and asynchronous *learning engagement* whilst making the design process (and learning process) visible in ways rarely achieved in traditional studio environments (Jones, 2020, p. 45). This has also assisted *assessment*, offering a record of peer-to-peer and tutor feedback, as well as the ability to present, review, grade and moderate remotely. Fotaris *et al*. (2015) note the importance of shared platforms in virtual design studios for "providing students with both creative stimuli in the form of the work of their peers and with peer-review comments." The authors emphasise that, "studying the work of others can serve as an inspiration and therefore lead to approaching the design problem from different angles." Furthermore, Jones (2020) notes that the concept of "social comparison […] can be most easily applied by making student work visible to peers, just as would happen in a traditional studio" (p. 33). In other words, students who are geographically distributed can position their projects within a collective body of work. Other scholars have noted that cloud-based collaboration tools can help students develop skills for professional practice, providing "a setting for a rehearsal of future workplaces and [helping] prepare students for a global, networked, and competitive professional design practice" (Pektaş, 2015, p. 262).

For dual delivery, when it comes to facilitating *interaction* across learning modes, virtual whiteboard platforms have a particular advantage over simple LMS sites or social media platforms (like Facebook, as discussed by Schnabel & Ham, 2012). As Jones (2020) argues,

> *"The potential difficulties in online discussion can also be an advantage in design – we engage in dialogue about design and around objects of design. Using artefacts to negotiate conversation works well at a distance (p. 14)."*

Beyond its benefits for assessment, skill development and engagement, participants also noted the cohort-building advantages of virtual whiteboard platforms:

> *"I think that some of the stuff that we learned with the online modality [in 2020] actually makes this idea of a singular and total cohort much easier to communicate. … [On online whiteboards] the work stays up for the whole week and the students can look at one another's work, and they really are doing that. … So I get the feeling that students do feel like they belong to that larger entity."*

The ability for students to interact with one another through their work—the dyadic relationship between "doing" and "belonging"—is a key dimension of the "occupational engagement" that professional design education aims to cultivate (Thompson, 2019). This is marked by,

> *"…the sense of togetherness that one acquires through studio socialization via shared design activities (including but extending beyond collaborative design projects and group critiques), shared points of cultural reference, shared interests, and shared project or course objectives." (ibid., p. 76).*

Learning Design for Contingency

Given the initial shock that came with moving design studios online in March 2020, the calm of subject coordinators by early 2021 was noteworthy. The pandemic exposed the fragility of many traditional approaches to subject design, especially for design studios that were dependent on physical modelling, campus-based technology and site-specific experiences or documentation. There was a sense of command born of hard-won experience within an inherently unpredictable context. As one participant put it,

> *"The big change was in the previous semester, I feel, and what we are experiencing now is just, sort of another version of that big change."*

As designers themselves, they approached the challenge with creativity and interest. They described their approach to learning design as flexible and incorporating notions of contingency in the framing of learning activities and assessment:

> *"If, for instance, there was another lockdown, we wouldn't have to change anything at a structural level. The teaching modality would just shift for those face-to-face studios, but structurally, there would be no need to change anything."*

This approach follows the University's own guidance for dual delivery, that online learning and teaching modes function as the "default" position in terms of TLA design. Still, one participant voiced that this sense of uncertainty had its challenges, perhaps alluding to the psychological impact on teachers:

> *"I suppose the not-knowing is just something that sticks in my mind. And there's different schools of thought. … I know that within our department there's this idea that, 'Okay, [dual delivery] is just a temporary situation, we'll be going back to class online.' And I think, 'That's not the way things feel!' … It'd be nice to know where we're going — not that I know we can know."*

This notion of contingent teaching, differing from existing concepts of "flexible learning" (Tucker & Morris, 2011) or "adaptive learning" (Fournier-Viger *et al.*, 2010), can be understood as an extension from previous scholarship on the notion of uncertainty as an inherent feature of teaching (Helsing, 2007) and as an aim of education to promote student autonomy and resilience (Joosten, 2013).

In practice, participants approached dual delivery by weighing options for TLA design against the key considerations; they suggested equity was their primary concern, with an eye towards cohort building and maintaining consistent and clear communication. In theory, this granted a reflexive approach such that, if circumstances or input from students and tutors were to change, coordinators understood how modifications to TLAs would impact each learning mode.

Conclusion

While the 2020 move online delivered a shock to the system and a scramble for response, insofar as 2021 is "the year of hybridization" (Laker, 2021), it has opened a more nuanced set of challenges. Institutional efforts to engage with people located both proximate and distant is

giving birth to new activities and cultures, as well as new approaches to support them. The approach explored in this paper, which combines online and blended learning modes within a single subject cohort, is an early example of dual delivery being applied to the design studio context. While "the use of new participatory tools allows for many-to-many interaction, which corresponds better to the new modes of design practice" (Pektaş, 2015, p. 258), it also brings challenges to pedagogies that value physical engagement with site and artefact, and interpersonal exchanges that support dialogic learning.

This article shares guidance developed for dual delivery by BEL+T, a learning and teaching group in a comprehensive Australian university, distinguishing approaches recommended for the delivery of learning resources or support of assessment and feedback from tactics for effective learning interactions and fostering a sense of belonging. The article also highlights key considerations identified by the group—learner equity and access, cohort building and staff and student perceptions—then reports on efforts by studio coordinators to address these through the design and coordination of their studio subjects. It identifies emergent ideas and practices from this early experiment with dual delivery in design studio education, including those that address: spatial/place-based remote learning; peer-to-peer interaction around design artefacts; and learning design for contingency.

The article outlines further development opportunities as the experiment progresses—ways to build bravely on these emerging lessons by exploring a wider variety of teaching and learning activity types, while remembering the importance of key considerations. It encourages testing of new pedagogic forms that can combine learning modes across space, and engagement with activities over time, in support of rich design learning for emerging hybrid cohorts.

Privacy and Confidentiality Statement

Full permission and authorisation to use private data has been arranged.

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