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Designing online teaching and learning experiences using the Conversational Framework: Reflections from a design discipline

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Abstract

Teaching and learning (T&L) in design has historically relied on a face-to-face approach necessitated by the discipline's technical, practical, and pedagogical requirements. Close, interactive, and iterative engagements between lecturers and students in the thinking, planning, and making processes is integral. However, contemporary digital media and technological developments and affordances, along with insights from the COVID-19 pandemic, continue to provide opportunities previously unexplored, or only partially explored, in online design education. We seek to understand how insights and lessons gleaned during and after the COVID-19 pandemic-enforced lockdowns can be applied in designing online T&L in design. We draw on Laurillard's conversational framework's interactive and adaptive strategies in leveraging contemporary digital media affordances in online teaching. Conducted between July 2020 and October 2022 by three lecturers in a design department, the study takes a reflective practice approach and draws on emergent design principles. These provided a foundation for rethinking pedagogy, blending research and teaching, and leveraging technology for T&L in design disciplines. Our findings show that online T&L in design requires intentional pedagogy-focused training, equitable access to resources for students, structures for peer collaboration, flexibility in curriculum delivery, and attention to student and staff emotional, psychological, and financial well-being.

Keywords: Adaptive teaching and learning; design pedagogy; interactive teaching and learning; online and hybrid learning; student and staff well-being

Context

Design education, to a significant extent, has relied on a traditional design studio setup in which teaching and learning (T&L), for the most part, is primarily based on an engagement between the lecturer or tutor and the student in a one-to-one, one-to-many or many-to-many format. The onset of COVID-19-enforced lockdowns in 2020 required an emergency transition from the traditional design studio to a fully online space. This transition provided opportunities previously unexplored, or only partially explored, in teaching design in a fully online T&L environment, but conversely posed new challenges that needed urgent interventions. An effective T&L experience during this transition needed adjustments, a reimagined approach, and modifications in instructional design.

We reflect on the experiences and strategies used to design and develop online T&L in a South African university's design department, seeking to answer this research question: How can the insights and lessons gleaned during the COVID-19 pandemic be applied in designing online T&L experiences in a design discipline? To critically engage with this research question, we use Laurillard's (2001) conversational framework (CF) as a conceptual lens. We reflect on how Laurillard's interactive and adaptive strategies were implemented with the intention of fostering inclusivity, engagement and equitable access for diverse student cohorts, and leveraging contemporary digital and online media affordances in an online teaching space.

The study adopts a reflective practice approach, incorporating both reflection-in-action and reflection-on-action approaches as employed

by three lecturers in a South African university's design department. The three lecturers regularly met and reflected on their online T&L experiences between July 2020 and October 2022 (during the COVID-19 pandemic). These reflections were based on Schön's (1983, p. 79) ideas, which he asserts lead to good design practices. Schön (1983) advocates for the designer to reflect on their design process in the construction, strategy and problem-solving in their design practice. The study also draws on emergent design, which Pailthorpe (2017) describes as the ability to adapt to new insights, concepts or discoveries during qualitative research, allowing for greater flexibility in research conceptualisation, data collection, analysis and composition.

The article begins by unpacking design pedagogy that draws on Laurillard's (2001) CF. Two of the core strategies in this framework, the interactive T&L strategy and the adaptive T&L strategy, anchor the reflections in this article. The methodology is provided, followed by a discussion on the reflective insights, lessons, and application.

Design pedagogy

Laurillard (2001, p. 48) correctly notes that learning through practice or imitation of practice is a method used to facilitate learning at universities. Design, as a discipline, extensively relies on this approach as its objectives are for the design student to gain actionable knowledge in order to produce tangible design solutions that could be products, experiences, spaces or services through their engagement with design epistemology, phenomenology and praxeology. Goodyear (2015, p. 27) defines design epistemology as the study of "designerly ways of knowing". This focuses on design thinking, design theories, design methods and methodologies, among other ways of knowing in the design field. Goodyear (2015) views design phenomenology as the study of the products of the design process, focusing on the nature of these products and what can and should be designed. Goodyear (2015, p. 42) defines design praxeology as the study of the practices and processes of design. Design pedagogy also extensively relies on the practice of formative continuous assessments, which seek to enable design students to learn and be assessed through the making of a product, solution, or service in an iterative process. Iterative processes entail constant refinement and improvement of the design product, solution or service, and this inevitably entails constant and regular presentations and feedback sessions.

The conversational framework – A conceptual lens

Laurillard (2001) and Tomczak and Bel (2021) contend that the conversational framework (CF) serves as a guideline for determining the best combination of learning media for a specific learning goal. It can be used to facilitate learning opportunities at various distinct stages (Laurillard, 2001; Tomczak & Bel, 2021). Laurillard (1999, p. 115) asserts that the CF is a practical tool used by lecturers to serve as an intermediary between the students and lecturers, leveraging educational technologies to help students with their complex design problems. She argues that CF supports the blurring of the lines between teaching and research as separate activities, and that the lecturer should be regarded not only as a researcher and teacher, but also as a researcher into their subject's teaching, bridging the gap between the two (Laurillard, 1999, p. 119).

The CF is a pedagogical model that structures learning as a technology-mediated dialogue between teachers, students and their environment, emphasising four core interactions or teaching strategies. The first is the 'interactive' interaction, where students engage with tasks and receive feedback (Laurillard, 2001, p. 115). In the design disciplines, an example of this could be instances in which design students iterate prototypes through peer critique sessions. The second is the 'adaptive' interaction, which involves teachers modifying tasks based on student feedback. For instance, adjusting tutorial difficulty according to quiz analytics (Laurillard, 2001, p. 102). The third is 'discursive' interaction, which entails teachers and students negotiating goals and interpretations through discussions such as online forums or clarifying assignment criteria (Laurillard, 2001, p. 89). The fourth is the 'reflective' interaction where students evaluate outcomes against goals to refine understanding (e.g., journaling to analyse feedback for

improvement) (Laurillard, 2001, p. 124). These interconnected interactions form a cyclical learning process, facilitated by educational technology.

In this article, we chose to focus on the first two interactions, shown in Figure 1, the *interactive* and the *adaptive* teaching strategies. These two interactions offered us appropriate and relevant tools, in our context, to reflect on our design of online T&L experiences in a design discipline. We unpack these two interactions in more detail below.

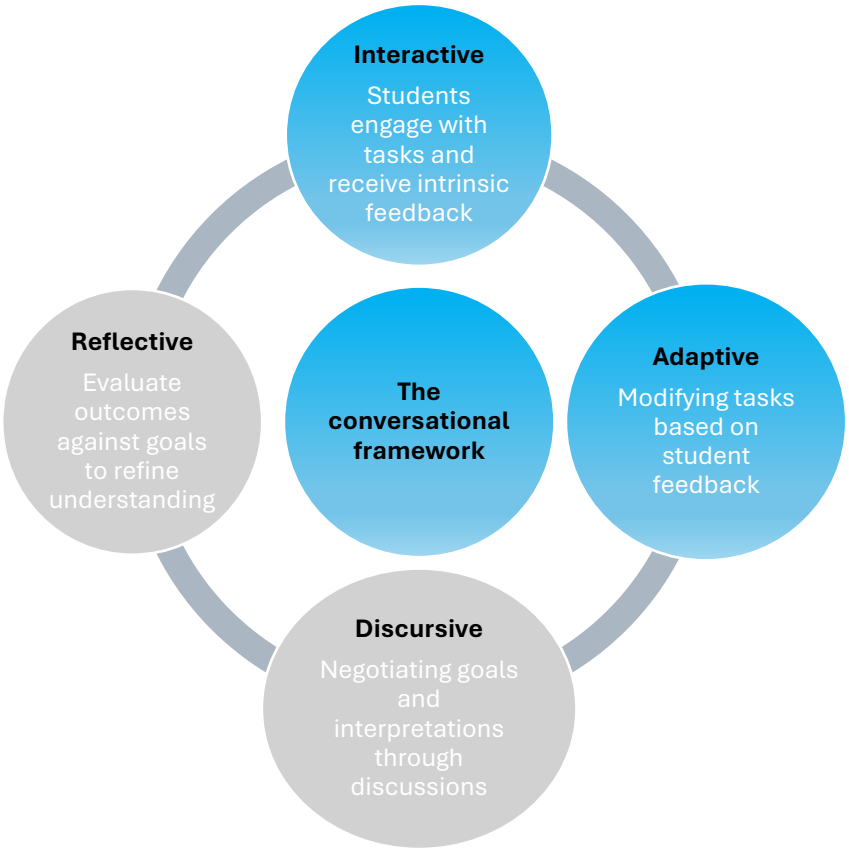

Figure 1: Laurillard's conversational framework teaching strategies (Designed by authors, 2025).

Interactive Teaching and Learning Strategies

Some experts suggest that interactive teaching and learning manifest in any T&L environment, while others explore it within an online or technology-mediated space. Spector (2015, p. 222, as cited in Tadesse et al., 2021, p. 5) views interaction as a process of giving and taking between one or more students and an instructional system or environment that may include human tutors and teachers, but could also be facilitated by technology. Goodyear (2015, p. 32) avers that interactive forms of teaching should involve "real-time exposition and other kinds of direct instruction, as well as facilitation of students' learning activities".

Kalyuga's (2007, p. 387) insights on interactive teaching and learning focus on the learning context, proposing that interactive learning environments should respond dynamically to students' actions and that interactive learning is associated with active, student-engaged processing of learning materials. Moreno and Mayer (2007) seem to concur. Their view is that interactive learning should not be a one-way process from the lecturer to the students. They propose that, "Underlying interactivity is the idea of a two-way action (between student and lecturer) as opposed to a one-way action (i.e., from lecturer to student)" (Moreno & Mayer, 2007, p. 310). For them, "The goal of the participants' actions needs to foster learning, that is, to help the student change his or her knowledge consistent

with the instructional goal" (Moreno & Mayer, 2007, p. 310). What emerges from these definitions is that interactivity in T&L is an *active, dynamic, real-time, two-way* process with the ultimate goal of enabling learning to take place.

Laurillard (2001, p. 48) argues that for an interactive teaching strategy to be impactful, effective and efficient, the processes of giving and receiving feedback between lecturers and students are central. Her view is that any action in the T&L process that is devoid of opportunities for feedback is unproductive for the student. Laurillard (2001, p. 48) convincingly argues that:

As we learn about the world through acting on it, there is continual feedback of some kind. If we can make the right connection between action and feedback, then we can adjust the action accordingly and this constitutes an aspect of learning. Receiving feedback is important. Being able to use it is also important.

In design education, feedback from lecturers and peers is a core aspect of T&L as it informs and impacts the design iterations that culminate in the final design prototype, product or service.

Adaptive Teaching and Learning Strategies

Murray and Pérez (2015, p. 112) propose that people differ in their learning needs and approaches, and the learning strategies adopted impact knowledge acquisition, retention and transfer of knowledge, as well as general learning success. In the context of design education, these differences are particularly pronounced due to the diverse skill sets required, such as creative problem-solving, technical proficiency and iterative prototyping, which demand tailored teaching approaches to encourage both artistic and critical thinking skills. Adaptive learning strategies attempt to meet each student's learning needs and can be supported by creatively incorporating 'tailor-made' adaptive learning technology (ALT) (Murray & Pérez, 2015, p. 112). For design students, adaptive learning technology can be used to customise learning experiences, such as providing targeted tutorials on software like Adobe Creative Suite tools, based on individual proficiency levels, ensuring that novices and advanced students' progress effectively. This allows teaching to become more personalised, efficient and relevant, as educators and learning platforms can offer the right content, support and feedback at the appropriate moments (Zhu et al., 2016, p. 3). In design education, this could involve real-time feedback (linking to the interactive strategy above) on iterative design projects, enabling educators to adjust tasks or provide specific resources, such as tutorials, to enhance learning outcomes.

Laurillard (2001, p. 192) introduces the concept of "designing the locus of control", which speaks to adaptive learning. Laurillard (2001, p. 192) states, "The key issue is the locus of control in the program – does it rest with the student, program or both?" She argues that it is imperative for individuals to have control, as it may be difficult to predict each student's pace and chart their progress. Thus, a student's honest self-reflection is important for adaptive learning to be a success. Laurillard (2001, p. 192) observes that for the adaptive learning process and adaptive learning technology to work successfully, students need "to adapt to their actions, reflect on the goal and carry out the action – feedback cycle". She calls this the 'reflection-adaptation cycle', which she proposes is essential and must be supported with teaching materials. In design education, this cycle is crucial, as it mirrors the iterative design process where students reflect on their prototypes, receive feedback (from peers, educators or adaptive learning technology), reflect on this feedback and adapt their designs accordingly.

Adaptive learning incorporates student-specific factors that help shape a tailored learning experience for students. The Smart Sparrow (2005) platform identifies several of these student-specific factors including 'student performance', such as response accuracy and checking if students understand learning material, 'recognition of prior knowledge' that a student brings into a learning environment, and 'behavioural data' that may include time spent by a student on specific tasks and other useful data sources for student advancement. These factors are crucial for tailoring teaching to individual design students. For instance, student performance might track a student's ability to apply design thinking

principles, while recognition of prior knowledge could account for a student's familiarity with tools/software like Adobe Lightroom or Adobe Photoshop. Behavioural data could reveal how long a student spends iterating on a design project, informing educators on how to support learning. For instance, a student struggling with creating effective design layouts might receive additional resources on visual hierarchy, enabling a more effective design process.

By incorporating these elements, adaptive learning systems are able to move beyond a one-size-fits-all approach, instead customising educational experiences to better support student engagement, progression and retention. This customisation encourages creativity and technical mastery in the design field, ensuring that students develop the diverse competencies needed for professional design practice, from conceptualisation to execution.

Methodology: Reflection and Tacit Knowledge

This article emerges from reflective discussions by three design lecturers who engaged in ongoing, informal conversations about their experiences teaching online during the COVID-19 pandemic. Unlike traditional qualitative research, where data is systematically collected for analysis, these exchanges were unstructured, evolving organically through shared challenges and insights. The process entailed three lecturers in a university's design department meeting regularly and reflecting on their online T&L experiences during the COVID-19 pandemic between July 2020 and October 2022. The meetings involved reflection-in-action (guided by real-time adjustments) and reflection-on-action (informed by post-semester evaluations in two modules facilitated by each lecturer). The reflections focused on the experiences of teaching six design modules, each with 20 to 70 students.

Discussing the design professions in his seminal book *The Reflective Practitioner: How Professionals Think in Action*, Schön (1983, p. 79) lucidly contends that conversation with a design situation is usually reflective in a good process of design, such that "the designer reflects-in-action on the construction of the problem, the strategies of action, or the model of the phenomena, which have been implicit in his moves". Drawing on Schön's work, Pretorius and Ford (2016, p. 241) explain that reflection occurs in two ways: during the moment of practice ('reflection-in-action') and retrospectively after the practice ('reflection-on-action'). Schön (1983, p. 69) contends that when practitioners reflect in and on their practice, possible objects of reflection include tacit norms underlying judgments, strategies implicit in behaviours, feelings leading to decisions, problem framing, and the roles constructed within institutional contexts.

Our reflective process drew on emergent design, which Pailthorpe (2017) describes as the ability to adapt to new insights, concepts, or discoveries during qualitative research. Unlike traditional deductive and structured methodologies, emergent design operates inductively, allowing for greater flexibility in research conceptualisation, data collection, analysis, and composition (Pailthorpe, 2017, p. 1). This approach can be understood as a reflective dialogue between the researcher and the design space, supported by technologies available to them. Informal discussions often emerged from encountered teaching challenges, providing a platform for the authors to share experiences and exchange tacit knowledge, which is a crucial element for addressing complex T&L contexts. These discussions yielded solutions or facilitated the emergence of potential resolutions, encouraging dynamic thinking and decision-making immersed in professional practice within the scholarship of teaching and learning (SoTL) in design.

The study's approach incorporates what Polanyi (1966) describes as *tacit* knowing: an intuitive, often inarticulate understanding of how to navigate complex situations. These exchanges were not captured through formal data-gathering methods but instead followed an emergent design approach, where insights were selectively integrated into each lecturer's teaching practice. For instance, when evaluating which strategies to retain or discard, we engaged in reflection-in-action, adjusting methods in real time while grappling with the unfamiliar terrain of fully online design education. Examining these reflections sheds light on how educators in

practice-led fields, such as design, negotiate uncertainty, improvisation, and institutional expectations during times of disruption. The findings below are structured according to the two strategies employed in the conversational framework: the interactive T&L strategy and the adaptive T&L strategy.

Our study focused on lecturers' perspectives due to constraints encountered during the reflection period, such as obtaining ethical clearance in order to include student and institutional-specific data, and the emergent, inductive nature of the methodology during COVID-19. Not incorporating student voices and institutional data reveals a limitation of this study.

Interactive Teaching and Learning in Design

One of the key challenges that was immediately apparent in the online T&L environment during the COVID-19 lockdown was that we could not consistently use video conferencing for our lectures. This was primarily for two reasons. The first reason was that not all students could afford to purchase data to connect to these online sessions. The students received a specific amount of data from the university for their online activities and were required to manage its use. Video conferencing consumes significantly more data than using only audio conferencing; therefore, we were compelled to opt for the latter. The second reason was that students' systems regularly buffered or froze because of the high data consumption of video conferencing, causing interruptions in the synchronous lecture sessions.

This inability to use video in the online space meant that interactivity in the T&L environment was lessened compared to face-to-face sessions, as the lecturer could not access visual cues and communication from the students, and vice versa. It was necessary to find ways to design and enhance interactivity between the lecturer and students, as well as among students, to improve the interactive teaching strategy within the conversational framework.

Strategies and approaches in design pedagogy

The emergency move to the online space meant that an immediate rethink of the teaching strategies and processes was necessary, as these had primarily been implemented face-to-face in lecture rooms, departmental labs, workshops, and consultation venues in the design department prior to the lockdown period. Several synchronous platforms, such as Blackboard, Teams, and Zoom, offered affordances that played a significant role in enhancing interactive T&L. These, however, may have been insufficient for the interactivity that was needed in teaching design at the time. It became necessary to supplement these affordances with asynchronous interventions. The following sections discuss some of the ways in which synchronous affordances and asynchronous interventions contributed to interactive T&L during this period to achieve Laurillard's (2001) technology-mediated dialogue between teachers and students in the COVID-19-enforced lockdown environment.

Synchronous affordances

The primary platforms we used during the emergency move to the online space were Blackboard Collaborate, Zoom, and Teams. Lecturers opted for one of these depending on the lecture or workshop needs and the functions that each platform provided. All three platforms had basic interactive functions such as raising hands, yes/no, go slower/faster, and take a break, among others, which allowed students to synchronously interact with the lecturers or tutors. Although these functions were able, to some extent, to give a sense of the students' level of engagement with the sessions, without the use of video, we did not have access to students' facial expressions and reactions. In an attempt to facilitate better interactivity in teaching design, we used additional synchronous interactive tools such as whiteboards, annotations, chat, polling, and feedback surveys. These tools provided better interactivity in synchronous sessions compared to the previous basic interactive functions. Whiteboards and the chat tools, for instance, offered a synchronous interactive function in which the lecturer or tutor could ask questions and receive immediate responses from students. The platforms also offered an opportunity for a synchronous feedback loop that enabled Laurillard's (2001, p. 78) conducive and appropriate environment for acting on, generating, and receiving feedback. Functions such as polling or feedback surveys were useful for

the lecturer or tutor to determine students' engagement or views on the content of the lectures and workshops.

Certain lectures on design praxeology and some workshops, tutorials, and sessions that focused on engagement with smaller groups or individual student work demanded smaller classes for effective T&L, especially for feedback. Synchronous affordances, such as breakout rooms in Zoom, were invaluable for meeting these requirements. Learners could either choose which breakout rooms to enter or alternatively, the lecturer or tutor could assign students to specific breakout rooms depending on the T&L objectives. The lecturer or tutor could then extensively engage with these smaller groups or individuals, offering more in-depth feedback loop opportunities before moving to the next group or individual. Chat functions were still available to enhance the synchronous interactivity in these breakout rooms.

At the start of online classes, students were informed of opportunities to ask questions at a designated time. Students were allowed to raise their hands or type their questions in the chat. However, the questions and answers would only be addressed at specific times during the online sessions. Some students chose to unmute their microphones and ask questions during the Q&A session, while others preferred to use the chat to type in their inquiries. Students could also use the 'like' tool to like questions in the chat box, indicating they had similar queries. Allocating a specific time for Q&A sessions also helped lecturers manage the in-platform affordances, reducing the number of browser windows they had to juggle.

These synchronous platforms, however, presented challenges to aspects of engagement. Some students were uncomfortable showing their faces on the online platforms while asking questions, compelling lecturers to find creative ways to engage with them. The option to raise a hand on Blackboard was one such tool that allowed lecturers to check in with students and ensure they were still part of the class, even when there were connectivity issues. As a result, lecturers had to consider how and when to use the available resources to facilitate online synchronous classes effectively. Other strategies included asking the class representative to make contact via other platforms, such as WhatsApp, in cases where there was a communication breakdown in the synchronous class at the start of the session, and to avoid sending multiple texts at once.

Some courses, such as photography and cinematography, demanded additional hardware to enable effective and efficient interaction in the T&L experience, especially in the giving and receiving of feedback between lecturers and students (Laurillard, 2001, p. 48). In these courses, the lecturer or tutor needed to see exactly what the students were seeing on their screens, while also needing to provide synchronous teaching and feedback. Teaching one such course in our context, one lecturer acquired his own setup in a complex multicamera and multicomputer configuration for effective T&L, specifically for effective feedback sessions. Figure 2 shows the Viozon selfie desktop live stand, which enables the lecturer to use a multicamera setup in conjunction with online synchronous platforms such as Zoom, Blackboard Collaborate, and/or Teams. Figure 2 illustrates a basic setup consisting of a single laptop, a DSLR or mirrorless camera, an external microphone, and supplementary lighting. However, some synchronous classes required a multicamera setup and more than one monitor.

This setup highlighted the need for lecturers to think beyond institutionally available resources or to find ways to augment synchronous affordances available in the platforms used at the time. In the example of the Viozon setup, external equipment was required to replicate the classroom experience as closely as possible in some design courses, facilitating effective T&L. During the post-lockdown period, the Viozon setup gained additional usage in online feedback sessions with students and for postgraduate research supervision support.

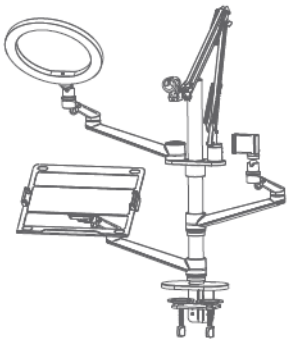

Figure 2: Selfie Desktop Live Stand Set 6-in-1 (ZB-2) (Viozon, n.d.)

Asynchronous interventions

Although the synchronous affordances were invaluable during the emergency transition to the online space, these were insufficient in our design education context. It became clear that asynchronous interventions were necessary, especially for the more technical and practical courses and units. In some instances, T&L entailed a concurrent synchronous use of in-platform affordances with asynchronous interventions, while in some contexts, the latter was used independently.

Online asynchronous tutorials and recorded presentations or lectures became a necessary intervention when teaching software use, coding or technical design courses such as animation, cinematography, editing, and photography, among others. In a face-to-face context, the lecturer or tutor has multiple opportunities to observe the students' application of these skills and knowledge in a classroom space and offer assistance and feedback whenever needed. This opportunity was not always available in an online synchronous space because of some of the restrictions and challenges already discussed. Creating these tutorials and recorded lectures offered some mitigation to these challenges. Students could download these lectures and tutorials and refer to them at their own pace and time. This enabled students to pick up on aspects, processes, or actions they may have missed during the synchronous lectures. The tutorials also offered opportunities for troubleshooting and resolving common challenges in the application of the software and technical processes in a space, pace, and context that suited the student.

Other asynchronous interventions used during this period included interactive platforms, such as Google Forms, which provided more functions and efficiencies compared to synchronous platforms. Google Forms, for instance, were used in design courses that required surveys from students. They were also used for student submissions of multimedia design artefacts and projects, and for engaging with multiple-choice and short-answer questions, among other usages. These opportunities eased the pressure for students to respond immediately during synchronous sessions. Students were able to take some time to think and reflect before completing tasks and submitting them to their lecturers.

In some instances, it became necessary to use synchronous and asynchronous platforms concurrently, as one mode of platform may not have had all the requisite functions needed in specific T&L contexts. In the T&L of narrative-based design aspects, such as scripting, storyboarding, character design, environment design, and production design, among others, both synchronous and asynchronous modes, as well as regular emails, were used to effectively communicate and enable effective and timely feedback loops. In scriptwriting, storyboarding, and character design, for example, lectures would be conducted synchronously, but feedback on individual students' projects would occur asynchronously.

Adaptive teaching and learning in design

This section discusses our reflections through the lens of Laurillard's (2001) adaptive teaching strategy, which involves modifying tasks based on student feedback to meet the individual needs of each student. Our efforts to implement this adaptive approach were guided by key components that facilitate personalised learning experiences. In order to effectively implement adaptive T&L, the Smart Sparrow (2005) platform proposes two components: adaptivity factors and adaptivity types. The platform considers adaptivity factors to be the elements of the learning process that can be personalised for students, while

adaptivity types are the methods by which adaptation occurs in learning environments. Our reflections on adaptive T&L were premised on these components.

Adaptivity factors

Adaptivity factors review students' information profiles, behaviours, performance, demographics, and level of prior knowledge (Smart Sparrow, 2005). Adaptive educational tools have the ability to customise learning experiences by considering various factors. There are three adaptivity factors: performance, behaviours, and information (Smart Sparrow, 2005). We unpack each of these strategies in relation to our insights, lessons, and execution of these principles during the COVID-19 period.

Performance

The first adaptivity factor, performance, refers to observing the students' ability to understand their deliverables, their response to learning new tasks and content, and proactivity. Student performance was one of our main concerns when we implemented remote learning, as many factors arose during the pandemic which impacted academic outcomes. The emergency shift to online learning resulted in increased challenges for our students. In addition to the data challenges, some students did not have access to compatible learning devices or any devices at all. Some students experienced increased socio-economic, mental health, and personal or family challenges, among several other challenges. We therefore had to reflect on our students' academic performance, support them, and present possible interventions to mitigate the effects of the pandemic on learning experiences. We also had to assess their ability to use the digital affordances available to them.

As a result of the issues mentioned above, we realised that some students were underperforming in some areas. Underperformance would sometimes be as a result of not comprehending the instructions rendered via our official learning management system or emails. We therefore had to adapt to alternative platforms such as WhatsApp, Zoom, and Teams or adapt the ways in which we communicated with students, which yielded positive outcomes. For instance, to clarify complex technical instructions that were often lost in lengthy emails, we began sharing short demonstration videos via WhatsApp. This allowed students to see the process visually and ask for immediate clarification in the group chat, ensuring everyone understood the task before proceeding. We also broke down design projects into sub-assessments and tracked the students' progress weekly rather than over longer periods, such as mid-term or end of academic term. Instead of giving one big project due in weeks, we would ask them to present their progress to us on a weekly basis, or an even shorter period where feasible. In some cases, we would group the students together to ease the workload for both students and lecturers. This approach assisted students without devices or those with other resource constraints to participate and contribute to the group, and therefore maintain their performance. A lack of student participation or activity in these platforms was used as an indication of the students' inability to use the platform or access the platform. Using this data allowed educators to develop more training sessions and provide alternative assistance to students where needed. This monitoring of students' participation allowed the educators to adapt their strategies and approaches for T&L.

Behaviours

The second adaptivity factor, behaviours, is focused on an individual's response to change, which is usually unanticipated. Behaviours could be students' coping mechanisms and the modification of thoughts in response to new circumstances, environments, or situations, particularly regarding the new mode of T&L. We created various adaptations due to the circumstances, which meant that students had to adapt to using the available tools for remote learning, new techniques and platforms. During face-to-face T&L, students would submit hard copies of their design work or send these to a particular server or designated folder on a desktop in the institution for submission. During the COVID-19 pandemic, lecturers introduced students to alternative cloud submission options, to which students had to adapt.

Lecturers set up submissions to grant students several attempts to submit their work before the due date. We learned that students would be anxious about whether they submitted the work correctly, whether they used the platform correctly, or whether other factors affected their submissions (such as network or electricity availability). Griffin et al. (2010) argue that it is imperative for individuals to demonstrate adaptive behaviour (change-oriented behaviours) where they are adapting to changing situations or environments and solving new problems. During the pandemic, students not only had to contend with academic changes but increased socio-economic, mental health, and personal or family challenges, which could affect their learning behaviours.

Information

The third adaptivity factor, information, is the customisation of information or data to suit the needs of students. This customisation is essential in design education, where students require tailored support to master diverse skills like visual storytelling. Data sources are used to create personalised student content levels and preferences that cater to students' interests (Selmeczy et al., 2021, p. 2). These data sources enable platforms to deliver resources, such as tutorials on design software or principles, aligned with a student's skill level and creative interests. For example, when some students struggled with specific software skills or film theory context, we provided targeted resources and information. Students unfamiliar with software would receive a link to a specific beginner's tutorial, whereas students grappling with theory would be given articles specific to the issues raised by the students. This proactive approach allowed us to see student errors not as failures, but as diagnostic tools to inform the specific information we provided. As Selmeczy et al. (2021) note, errors highlight a gap in knowledge and offer an opportunity to relook at learning processes. Errors in a project, such as a poorly designed layout, reveal skilled gaps that could be addressed through targeted feedback. The process of experimentation as opposed to seeking correct answers is adaptive because one avoids future misconceptions and errors (Selmeczy et al., 2021). The process of trial and error is flexible, involving students who are willing to engage in experiments with different solutions and learn from mistakes, rather than solely seeking correct answers. Trial and error promote greater cognitive engagement, allowing students to question their assumptions, improve their understanding of the material presented to them, and develop problem-solving skills. On the other hand, if students are only interested in finding correct answers without engaging critically with mistakes, they may be learning only at the surface level, which involves memorising information without fully comprehending its underlying concepts (Selmeczy et al., 2021). In design education, such surface-level learning could lead to replicating templates or mimicking references without grasping principles like visual hierarchy, which online adaptive systems counter by encouraging experimentation and reflection.

Adaptivity types

The Smart Sparrow (2005) platform states that "adaptivity factors can trigger unique responses, using *adaptivity types*. Based on what has happened in the student's learning journey, do you move them along as planned, provide hints, or reroute their learning pathway entirely?" The Smart Sparrow (2005) platform highlights two adaptivity types that we adopted: adaptive feedback and interactive feedback. Providing prompt feedback involved providing guidance on when a student was correct and guidance on why they were incorrect in the case of incorrect responses. Feedback would be tailored based on the student's work. This feedback is both interactive, encouraging real-time engagement between students and lecturers, and adaptive, as the feedback tailors guidance to individual student needs in online design education environments, such as those for design projects. Interactive feedback differs from adaptive feedback in that it prioritises real-time dialogue to foster collaboration, while adaptive feedback uses data-driven personalisation to address specific student errors, both enhancing online design education outcomes.

Insights and implications for T&L in design

These experiences and reflections during the emergency move to online T&L highlighted

the complexities of shifting design education (a discipline that has traditionally thrived in a face-to-face T&L mode) to a virtual space. It brought to the fore the need to creatively and experimentally use available synchronous and asynchronous platforms to recreate a T&L environment that supports practice-led pedagogy. The implication of this creative and experimental endeavour, however, was that significant amounts of time, energy, and resources went into attempting to recreate the face-to-face experience in the online environment. This competed with the work of advancing pedagogy in the department. A major challenge was the adaptation of online pedagogies. Although there are limited studies about design education specifically during the pandemic, our experiences were similar to those of colleagues in other disciplines. Mahlaba and Sekano's (2023) systematic review study analysed 52 research articles from 13 higher education institutions in South Africa on the implications of teaching, learning, and assessment after the COVID-19 pandemic. Their study identified several challenges faced by educators. Some of these included insufficient training in online T&L pedagogies and difficulties in sustaining student engagement and motivation (Mahlaba & Sekano, 2023). Singh-Pillay and Naidoo (2022) corroborate these findings. They found that at the University of KwaZulu-Natal, science and mathematics education lecturers questioned the adequacy of institutional training, which prioritised technical software skills over online pedagogy, leaving them uncertain about how to design effective virtual learning experiences and the quality of the pedagogy. This challenge was also mirrored at North-West University, where Mahlaba and Sekano (2023) found that many lecturers struggled with insufficient pedagogical preparation, in addition to increased workload and the need to learn new digital tools.

Although these challenges affected T&L in our discipline, we were able to mitigate, to some extent, the impact of the lockdown disruptions by using and experimenting with the technological affordances available to us in an attempt to find an environment that could support design T&L. We drew on a collegial community of faculty staff that met regularly to reflect on experiences and implement interventions that seemed to work while reviewing and adjusting those that did not. These lessons and insights have been invaluable in the post-COVID-19 context as they continue to inform our approach to T&L in design.

Regarding adaptivity factors, lecturers in several South African universities developed adaptive responses during the lockdowns. Similar to our context, at the University of KwaZulu-Natal, adaptivity took shape through virtual communities of practice, where lecturers collaborated to co-create online pedagogies, share resources, and provide mutual emotional support (Singh-Pillay & Naidoo, 2022). A strong ethos of virtual care emerged, with lecturers maintaining regular contact with students via WhatsApp, Facebook, and email, offering flexibility in deadlines, and adopting multimodal approaches such as YouTube demonstrations and home-based experiments to make practical learning possible remotely (Singh-Pillay & Naidoo, 2022). Concurring with our findings, Mahlaba and Sekano's (2023) systematic review concludes that higher educational institutions should adapt teaching methods and instructional design for online environments.

In our implementation of Laurillard's (2001) conversational framework, we initially placed strong emphasis on the technological aspects of online T&L. While this was undoubtedly valuable, we later recognised that our focus on technological integration could occasionally overshadow other crucial challenges, particularly the emotional, psychological, and financial well-being of our students. We found it necessary to guard against overly emphasising technical and technological aspects that could potentially overlook these important student needs. Mahlaba and Sekano's (2023) systematic review study also identifies the need to prioritise the emotional and psychological well-being of both students and lecturers as a key consideration that emerged in their study.

Conclusion

This study discussed the strategies, insights, and lessons gleaned during and after the transition to online emergency T&L in a design department at a higher education institution as a result of COVID-19-enforced restrictions.

Laurillard's (2001) conversational framework offered a theoretical lens in the discussions that focused on interactivity and adaptivity as facilitation strategies. The findings focused on the academic staff's efforts to develop innovative solutions for T&L given the inherently interactive nature of design education. The challenge was to transform traditional face-to-face interactive dynamics into online spaces with limited resources. This transformation was facilitated by utilising the institutional learning management system's inherent capabilities as well as external online tools. The reflective and emergent design study highlights the importance of exploring diverse solutions beyond the institutional framework to promote meaningful engagement in the online T&L landscape.

The sudden transition posed challenges such as maintaining student engagement in an online setting, effective and efficient use of online platforms and resources, access to online platforms, and effective and timely communication, among other challenges. Lecturers had to navigate the pedagogical intricacies of interactivity and overcome the structural hurdles introduced by the shift to online learning during a pandemic. Navigating the new pedagogical space led to a solution-based, organic evaluation of the necessary forms of interactivity and how they could be effectively translated into an online T&L environment. As design education relies heavily on interactive methodologies, the transition required a thoughtful adaptation from face-to-face to virtual modes of engagement.

The study found that integrating adaptivity factors such as performance, behaviour, and information as learning strategies in conjunction with the institutional learning management system and third-party online applications could potentially be used to improve the educational experience of design students. Strategies include tailoring learning pathways, providing prompt feedback, and adapting assessment approaches to enhance a design department's online T&L journey.

These insights and lessons highlight that effective online teaching during crises demands more than technological readiness. Effective online teaching in a crisis requires intentional pedagogy-focused training, equitable access to resources for students, structures for peer collaboration, flexibility in curriculum delivery, and attention to student and staff emotional, psychological, and financial well-being. Our reflective strategies in this study were not merely reactive but involved judicious appraisal of methods to retain, modify, or discard to uphold the integrity of remote design education.

Disclosures

Conflict of interest

The authors declare no competing interests.

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