Approaching design thinking online: Critical reflections in higher education

Sandris Zeivots, Carmen Vallis
The University of Sydney, Australia
Catherine Raffaele
University of Technology Sydney, Australia
Edward J. Luca
The University of Sydney, Australia

Design thinking is becoming more commonly used as a collaborative, problem-solving approach in higher education outside design disciplines. With the pivot to remote and online learning in response to Covid-19 and lockdown measures, many educators have had to rethink their practice and collaboration in design thinking, without the usual recourse to shared physical space and material resources. This reflective study brings together four educators who take their human-centred design thinking approaches to higher education online. Through a process of collaborative reflective professional inquiry, the authors offer practice-oriented insights into learning design, educational development and facilitation in design thinking online. Findings challenge commonly held assumptions about teaching online, the role of technology, and the importance of 'best practice' in education. The paper concludes with suggestions for future research to explore design thinking online as a practice and mindset outside the confines of the design studio.

Introduction

Higher education practitioners continue to grapple with the transformation brought about by the Covid-19 pandemic and its ongoing impact on the sector and education broadly. As four higher education practitioners working across different roles and disciplines, we were drawn together by our shared experiences of facilitating design thinking online for the first time. Our reflections, wrought by the rapid and unprecedented shift to remote work and online teaching, led us to consider what we had collectively learnt by rethinking our assumptions and approaches to design thinking. From behind our computers, we saw the world through a different frame. Hence this study is based on the professional inquiry: how to think differently about design thinking online? Four practitioners collaboratively engage with this question through the perspectives of: a learning designer who specialises in designing for large cohort classes with over a thousand students; an educational developer who co-designs subjects with business academics; a lecturer of leading innovative practices in a Master of Education; and a library manager who uses design thinking methods to develop library services.

Design thinking is a creative problem-solving approach that has become widely adopted in business, information technology, entrepreneurship and education. The process has evolved in different directions as a set of methodologies and material practices that can be applied in contexts beyond the design sciences (Kimbell, 2012). A diverse range of disciplines have embraced design thinking as an approach for problem finding as well as

problem solving, with an emphasis on empathy (Dawbin et al., 2021; Luca & Ulyannikova, 2020). Framing and solving problems with abductive reasoning often crosses boundaries and is multidisciplinary (Dorst, 2011). As such, design thinking has become part of the repertoire of higher education support services. Libraries, for example, increasingly draw on design thinking methods to better understand student needs, often in the context of improving services, spaces, and wayfinding (Clarke et al., 2020; Luca & Narayan, 2016). Increasingly, facilitators from diverse disciplines and across higher education work with novices to learn the methodology and mindset of design thinking, to collaboratively approach complex, ill-defined problems in unexpected ways and generate novel ideas (Mosely et al., 2018).

We found it challenging to define design thinking as the term has become so widely used that it might be better referred to as a collection of methods than a single philosophy. Kimbell identifies three strands of design thinking in the literature: as a cognitive style, as a general theory of design, and as an organisational resource (Kimbell, 2011). Ultimately, this diversity of opinion created opportunities for critical reflection. Our broader concept of design thinking encompasses "the kinds of thinking that occur in taking the design approach to deal with real-world problems or challenges" (Koh et al., 2015, p. 2). We consider human-centred design more important than ever when we are physically apart from one another, where organisational and technical constraints may reduce opportunities for empathy in education (Matthews et al., 2017). At the heart of our design thinking is centering user or student needs, designing learning experiences with and for participants, despite a challenging environment (Brown & Green, 2018). The critical reflections that follow articulate the complex and diverse ways our design thinking is enacted in practice, as a "situated and distributed unfolding" of teaching and learning, beyond the studio (Kimbell, 2012, p. 135).

These reflections and challenges to our assumptions are designed to stimulate educational ideas and new approaches to design thinking in an online space. Our work also led us to consider the role of studio pedagogy when there is no physical studio. We found that traditional in-person approaches to design thinking and findings from the literature did not always translate to this new environment; however our experiences motivated us to consider what new practices and pedagogies might be possible. This paper is intended to prompt further thought and debate and advance the use of design thinking in a post-Covid-19 educational environment.

Design thinking in education

Many educators recognise the value of design thinking for collaboration and problem-solving, as another method for shifting learning from the lecture hall into real-world challenges (Razzouk & Shute, 2012). Design thinking as a pedagogical approach is said to help prepare graduates who can practice "creative, cross-disciplinary, collaborative problem solving within the context of future problems" (McLaughlan & Lodge, 2019, p. 81). Researchers have identified design thinking skills as building capability to manage uncertainty and complexity (Beligatamulla et al., 2019). In business education in particular,

design thinking skills and methods are said to prepare students for ill-defined and ill-structured situations in the workplace (Dunne & Martin, 2006; Glen et al., 2014). Yet students from any discipline may learn valuable skills from such design thinking practices as prototyping, and articulating thought in non-verbal forms, visual and physical modelling (Cross & Holden, 2020). Design thinking methods can also be used as part of a flipped classroom approach, promoting creativity and active engagement (Das et al., 2019). Collaborating and communicating design thinking helps participants gain skills in negotiation, critical reflection and critique, in the process of creating tangible and implementable outcomes (Welsh & Dehler, 2013). Creative and innovative ways of thinking are learnt by joint problem inquiry, where unique solutions are developed by drawing on disciplinary skills and knowledge.

'Space and place' are fundamental to how studios are conceptualised and valued in higher education. Learning situated in studios with in-person interactions is highly valued by design educators (Fleischmann, 2019; Jones et al., 2017). Much is known about design thinking in studios and ateliers, as places for learning by making (Barry & Meisiek, 2015). Studio-based pedagogy in design-based subjects may emulate the apprenticeship models of artist and other creative professionals' workplaces (Crowther, 2013), and tends to be more loosely structured compared to traditional teaching, where learning is carefully planned and sequenced (Boling et al., 2013). On the other hand, educators know less about teaching design thinking outside of design disciplines and in online spaces (Vallis & Redmond, 2021). Now more than ever, educators are expected to be confident in digital pedagogical practices and understand how technology can best be used to support learning (Sheffield et al., 2018). Currently, much of the published research investigates online or virtual studio pedagogy in design sciences (Fleischmann, 2019, 2020; Yorgancio□ lu, 2020). Collaboration often still takes place in physical studios, with students preferring practice and guidance face to face, with online learning reserved for individual activities (Fleischmann, 2020). Remote design courses have tended to use learning management systems (LMS) as a space for students to upload and discuss design artefacts rather than collaborate on the design artefacts synchronously (Lloyd, 2013).

But what if there is no physical studio or classroom? Our work led us to consider the role of design thinking online. We found that traditional in-person approaches to design thinking and findings from the literature did not always translate to this new environment. Our experiences motivated us to consider what new practices and pedagogies might be possible. Together, we asked: what can we learn about design thinking online from critically reflecting on diverse practices? The critical reflections that follow articulate the complex and diverse ways our design thinking is enacted in practice, as a "situated and distributed unfolding" of teaching and learning, beyond the studio (Kimbell, 2012, p. 135). This reflective study is intended to stimulate further ideas and debate to advance the use of design thinking in a post-Covid-19 educational environment.

Collaborating through professional reflective inquiry

This paper approaches design thinking online through the perspectives of four higher education practitioners. Our approach was inspired by the work of Meisiek, de Monthoux, Barry and Austin (2016), who used the notion of 'voices' to share their reflections on engaging with art and aesthetics in management education. Exploratory, qualitative research is well-suited to the emergent conditions of teaching online during a pandemic, where traditional approaches are jettisoned in the face of the messy and unknown. This paper is underpinned by reflective professional inquiry (RPI), which invites higher education practitioners to engage effectively with new knowledge and ideas. Although 'reflective thinking' has been commonly used in nursing and medicine, Brown and colleagues (2021) theorised RPI as an emerging and under-conceptualised approach in education. They described RPI as a collaborative, dialogic process where practitioners consider and discuss pressing educational issues. This collective reflection aims to stimulate individual and collective perspectives and practices on design thinking online in higher education. Unpacking issues around design thinking online can be complex, and educational practitioners may often 'muddle through' and adopt 'simple recipes' (Mintrop & Zumpe, 2019) which may not be sustainable. RPI can assist in this process by offering a comprehensive analysis of the problem and potential solutions. Advancing educational practice through collaborative reflective inquiry is vital for academic and professional development; it has potential to cross disciplinary boundaries and avoid 'the danger of a single story' (Hoon et al., 2019).

Teaching design thinking online is situated in the physical world of its participants, and as such, materiality plays a crucial role in how we learn about design thinking online. In this study, four authors with unique sociocultural and sociomaterial practices (Fenwick et al., 2011) discuss and interrogate our experiences with design thinking online. We collaborated across different disciplines in two Australian universities, and following the RPI approach by engaging in a collaborative and dialogic process with three overlapping steps:

- *Collaborative writing sessions*
  We met regularly to write over a period of seven months. Collaborative discussions and writing using a video conferencing tool underpinned the development and structure of this article. We used these sessions to share our emergent thoughts, provide feedback on each other's writing and discuss how our broader context informed the writing process.

- *Iterative individual reflections and critical conversations*
  Although collaborative writing sessions were where significant portions of the writing emerged, we occasionally wrote and unpacked our experiences and practices in our own time. Our reflections were emergent, iterative and rooted in our practices and based around our professional inquiry on design thinking online.

- *Structural touchpoints*
  Our initial writing was inspired by the structure of Driscoll's (1994) and Borton's (1970) models of reflection. Emerging from this, our reflections were guided by three core questions: 'What?', 'So what?' and 'Now what?' Following this model in our professional inquiry ensured that our reflections were experience-based and relevant to other online contexts.

Our professional reflections are shared below, followed by a discussion of key assumptions that we challenged through the writing process. While these reflections are situated in our unique contexts, their implications may resonate across other educational settings.

Findings: Reflections

Carmen Vallis: Imperfect design

> Carmen has been designing for learning across disciplines in the school, vocational and higher education sectors since the last century. Her expertise is in digital design pedagogies, creative processes, and writing.

In early 2020, at short notice, I led a team that had to redesign a face-to-face design thinking workshop for online delivery for over 1,000 first-year business students. Inspirational transformation was off the agenda for the impending semester. We were frustrated by technical constraints to online collaboration at scale; available educational technologies seemed designed and developed either for content delivery or for small classes or involved registering with external commercial companies. Teachers were necessarily thrown into the deep end of these imperfect systems, without swimming lessons. I feared design thinking and collaborating without a dedicated physical space, post-its and whiteboards, might at best be stilted and complicated, at worst a technical nightmare.

But the class must go on. Firstly, our team developed a self-paced interactive online module, which curated leading design thinking resources and thought, so students could learn the context and basic process before class collaboration. In partnership with business academics I changed and abbreviated a design thinking activity to 'smoke-test' what worked and what didn't in online classes, to feed any learnings into future iterations. As in previous classes, students were challenged to design a chair, an adapted version of the Stanford design thinking exercise (Stanford d.school, n.d.). Unlike the face-to-face experience, the process of design was mediated by the LMS, web conferencing, and online whiteboard technologies.

I attended several classes to observe the smoke-testing in action. In one class, the teacher inadvertently allocated me to a breakout room and paired me with a student in Italy. Let's call this student Carlo. Suddenly I was both outsider and participant, observer and self-observed, and I felt the usual power relations of staff to student were instantly flattened. The lectern was replaced by our faces in equal-sized black boxes. Although we were both

surprised, Carlo had come prepared having completed the online module and wanted to continue; I was also open and curious about how the activity would work.

Next, Carlo and I needed to move beyond meeting and negotiate how to collaborate in this new social space. We soon abandoned sketching online, which, compared to paper and pen, was patchy and lagged, and competed cognitively with conversation. Carlo led, sharing and annotating his screen view instead of using the online whiteboard. Either the tools suited Carlo better or he had misunderstood the instructions, but his way of working served the activity equally well. How we articulated our ideas was less important than making them tangible in the shared virtual space.

Following the process, while physically removed, made me feel less self-conscious about the age gap between Carlo and myself in our ephemeral, simulated studio. Our differing height and weight couldn't be fully judged. This remote participation seemed different to the usual classrooms, where social distances are inscribed in bodies (Bourdieu, 1989). The way we stand, our deportment; these social cues were stripped away, which may have helped us overcome a sense of awkwardness. Our visual attention was directed to the common space of the shared screen and to documenting our design.

Our technology-mediated experience lacked the textures of the physical world, and sensory experiences. Was Carlo wearing expensive aftershave, and would that have subtly influenced our interaction? The quality of visual and auditory information was also reduced, perceptual cues were blunted. For example, the noise of a passing rubbish truck disturbed my concentration more than that of my virtual collaborator. In person, Carlo might have noticed how exhausted I was and adjusted his pace and communication accordingly. I was glad he didn't.

The insights Carlo and I gained from each other in this brief, unexpected collaboration were energising. Our crudely designed chairs reflected our needs and personalities, the activity flowed well, and we thanked each other. Design thinking remotely had technical challenges, particularly in prototyping. It takes time to adjust to design thinking online, to learning that is embodied in separate physical environments and joined by technology. Yet such an experience can open design thinking practice to different experiences across time and space.

Catherine Raffaele: Getting out of the (metaphorical) building

> Catherine has spent the past decade as a researcher of emerging work and learning practices. Over the last five years, she has designed and taught design thinking and entrepreneurial programs across multiple disciplines at undergraduate and postgraduate levels.

I taught a postgraduate subject in leading innovative practices. In this subject, students (who are often working professionals) identified a need for innovation using design thinking and entrepreneurial methodologies, ideated ideas to solve this need, tested their prototypes and then reflected on the process.

Physical space was central to this subject. Students identified a specific and bounded site to focus their innovative initiative on, with the most popular choices being their place of work or study. A core message of the subject was to 'get out of the building'. This was a phrase used by Steve Blank in his course in entrepreneurship in Stanford (2010) to better discover customers and fits with the human-centred design approach of designing with actual - not imagined - people. The students who performed the best in the subject were the ones who implemented this advice and actively engaged with other people - usually in face-to-face conversations. Thus, much of my energy was focused on supporting students to have these interactions.

Covid-19 suddenly made any in-person interactions unsafe, so I had to change my advocating of 'get out of the building' to 'get out of the building (virtually)'. In doing so, it raised the question: what was the 'building' I was referring to anyway? For consumer-focused innovations, this instruction was literal - it meant going out of your office building to where your potential customers are. However, for those who were innovating within their organisations and often for their immediate work teams, this could be more metaphorical - it meant going outside of your own headspace and talking to your colleagues (even if they were in the same building).

With the shift to online and remote learning, the physical space of students' focus sites suddenly changed. Within a few weeks of the semester, a lockdown was announced where those who could work from home were encouraged to do so. Instead of offices, university and community buildings, our students were working, studying and even supporting others in their community while they were situated in their homes. Most were able to interact with others synchronously online via video conferencing tools. A few had much more limited access, relying on 'smart' Internet-connected phones or older computers that struggled to support real-time video. Internet connections were not always reliable.

The planned project activities immediately became too much - we had previously had students doing in-depth empathy research in their community, then ideating and testing their initiatives. We had to dial down our expectations because they had other more important things going on in their life as they suddenly had to navigate a pandemic - as, too, did those around them, including people they hoped to involve in their initiative. So, I encouraged students to find alternative ways to interact with their target users and stakeholders, recognising that not everyone had equal access to tools and the Internet, so not just suggesting *Zoom* but also asynchronous tools like email, messaging applications and SMS texts that do not require continuous Internet.

What became apparent was that 'getting out of the building' could be done without leaving the building. For most of the initiatives, the physical space mattered far less than the psychological and emotional spaces. And indeed, we discovered that another benefit of meeting virtually rather than travelling to meet in person for interviews was that it created flexibility and convenience for those being interviewed.

The disruption of losing access to the physical space allowed us to revaluate the purpose of the directive of 'getting out of the building' and to identify what was, in fact, important.

I learnt that at the heart of this imperative is getting out of your own world view and perspective so that you can interact with other people's ways of seeing the world to better understand them. The push into the world outside the physical building is mostly a proxy for the psycho-social space. If you force yourself to go talk to people outside your space, it's not so much the space that matters but that you're talking to other people - that you are interacting with the world external to you.

Going from teaching design thinking in person to teaching it online was an opportunity to revaluate what really mattered. Rather than trying to recreate in a virtual space what might happen in an in-person space, it was far more fruitful to ask what was the purpose of the activity and what was important. In the case of 'getting out of the building', what mattered wasn't the physical movement, but that students were interacting with other people to understand and empathise with their points of view.

Sandris Zeivots: Care and try

> As a lecturer in educational development, Sandris investigates how to design and implement innovative and meaningful learning experiences in higher education. He has actively engaged with research on student engagement, experiential education, and positive emotional learning experiences across Australia and Europe.

Design thinking plays a critical role in the Business School where I co-design new and well-established subjects with academic staff. During Covid-19 I witnessed a range of apprehensive viewpoints and decisions, and within the early days of pivoting from face-to-face to online mode, some academics increasingly challenged the fundamental role of collaborative learning online: "you can't do a proper group work online"; "I was recommended to get rid of the group-based stuff to avoid student confusion". In one instance, a subject coordinator changed the group-based assignments from 30% to 0%, resulting in entirely individual assignments. These instances were frightening and challenged me to further my understanding on what *matters* in co-designing in this unprecedented environment. I learned that sudden change and unexpected turbulence can make design thinking emotionally charged, which, depending on the context, may affect the transition to online mode.

Two years ago, I taught an undergraduate subject for pre-service teachers. My take-away message for final year students was to 'care' and 'try'. Both terms rebounded to my attention this year when an academic (let's call her Zoe) helped me to re-appreciate the fundamental importance of caring and trying. Although we never met in person, Zoe and I co-designed a new postgraduate subject in business for online delivery. The first subject outline was shared with me as a blueprint for learning objectives and weekly activities, and I noticed multiple open-ended invitations for ideas such as "any suggestions?"; "how might we make this happen?"; "is there another way?" The questions went beyond a request for one-way feedback; they acted as in-depth triggers to spark a conversation for our initial e-meeting. It worked! It triggered a collaborative and process-rather-than-product foundation for forthcoming discussions.

Zoe's students had to collaborate on mini-research projects for the final three weeks of semester, and they required an online platform to simulate an authentic work environment. After I offered several options for student collaboration, Zoe responded: "I'm possibly the worst person with IT, but I'm interested in exploring *Microsoft Teams*". We went back and forth as to whether *Microsoft Teams* software was suitable for the subject and expected learning outcomes. These discussions primarily focused on the key stakeholder - the students. Zoe's comments, "I want them [students] to practice *stuff* they'll use after uni"; and "I'm not sure if it's a good idea to introduce a new learning platform, but... it sounds tempting for them to see what [software] is used in real workplaces", showed me that the coordinator *cared* for the students, their authentic learning and sustainable working practices. It was refreshing to see students as the focal point in these critical conversations.

What struck me during this design thinking process with Zoe was recognising the LMS and collaborative tools as important, but insufficient elements for quality online learning. Something was missing - something to challenge and push boundaries, and something to support and assist learning-by-doing. In this co-design process, I witnessed an openness to *try* engaging with unfamiliar ways of working and strong sense of *care* for student-centred experience. Upon further reflection, I found that the 'care and try' approach can provide a meaningful and inclusive environment to design a unit with students in the limelight. Ontologically speaking, this approach assisted us to take a step back, explore with care, and innovate.

Design thinking online is not as simple as a direct transfer from face-to-face to online setting. Design thinking is an approach, a framework, and at times a philosophy, not something that was built for an exclusive setting. As facilitators we have the power to allow and value new practices to emerge in their unique ways. A 'care and try' approach offers a curious, human-centred mindset to explore genuine possibilities for design thinking online, without losing the fundamental craft of connecting. 'Care and try' mindset values synergy and meaningfulness, which are critical for the complex environment of design thinking online. Put differently, 'care and try' is like wearing a new pair of prescription glasses - the reality appears slightly twisted, yet somehow clearer to what is possible and worthwhile.

Edward Luca: Facilitating connections

> Edward has been teaching design thinking for the past five years, working with students, researchers and library and information professionals. As a library leader, he uses design thinking methods to drive the development of client-focused services.

My first online design thinking workshop was eye-opening. We facilitated the workshop via web conferencing software and split our 50 participants into breakout rooms based on different themes. The participants contributed to an online whiteboard tool that replicates the post-it notes and pens of a traditional workshop. While explaining the activity instructions to the participants in my group, I frantically relayed timing instructions and feedback to the rest of the facilitators through another messaging tool. Many of our

participants had never used the online whiteboard tool before, so I was also providing technical support. One participant had joined the workshop on their phone, and the change of platforms led them to leave the meeting in protest. One simply wrote on a post-it: "I am struggling with this".

I found this experience stressful and disappointing. I felt as though I had spent more time coordinating the technology than being fully present in the workshop, let alone encouraging creative ideas. Since then, after reflecting on this experience and refining my approach in subsequent online workshops, I've realised two important lessons for design thinking online: keep it simple and stay energised.

Navigating digital tools as opposed to pen and paper means additional cognitive load for participants. A key role for the facilitator is to create an environment for participants to feel confident and creative. When introducing new tools, I learned that I needed to allocate time to allow the participants to become comfortable with the technology before diving into ideation or brainstorming activities. Building in a short activity to allow participants to gain familiarity with the tool provides the space to address technical questions early on and prevents the flow of the workshop from being interrupted later. Participants may face a range of distractions (technical or otherwise) on their end, so clearly signposting where the workshop is up to helps to manage questions and keep the session on track. For example, I soon realised that dividing the group into breakout rooms meant they could no longer see my slide deck. I had to instead incorporate my instructions into the tools being used, such as on the whiteboard tool itself. I found myself paying particularly close attention to these instructions. Once spoken cues and prompts were now translated into text; I needed to ensure that they were clear and unambiguous. Non-verbal communication can be difficult to gauge in an online space, so I felt particularly conscious of pre-empting any confusion about the task at hand.

There is a certain energy in the room when running a successful design thinking activity in-person. I've found that elements such as background music and playful instructions are helpful in crafting an environment that allows people to be creative. Even the small gesture of playing upbeat music as people enter the room can help set the scene for a session that is not going to be 'typical'. I believe that creating this energy becomes even more important when people are geographically dispersed. It's relatively easy to tell whether people are engaged when you're in a physical room together, and there are usually well-established norms about class participation. I soon realised that these norms were not so clear in my first few online workshops. Through trial and error, I learned that directly addressing etiquettes at the beginning of an online session helps to keep participants on task and sets expectations. For example, I asked participants to leave their cameras on and mute their microphones. A short icebreaker at the beginning of the session can replicate the experience of sitting down at a table with peers, and also helps to familiarise people with the technology and how you're going to use it. Shifting my workshops online prompted me to be more intentional in creating an engaging atmosphere, however, this ended up being a valuable exercise as it invited me to reflect on what I value most about in-person workshops.

My experiences in design thinking online showed me that a mindset of simply 'converting' an in-person activity to an online version is limiting. Designing activities purposefully for an online space can be liberating, rather than a constraint. Facilitators play an essential role in setting the stage for creativity, encouraging the energy and social connection that makes in-person learning engaging. Considering what these elements might look like an online space ensures that participants can best experience the opportunities of design thinking for problem finding and creative exploration.

Discussion: Challenging assumptions

Suddenly shifting design thinking pedagogy and practice from in-person to online spaces due to the pandemic forced us, as educators and facilitators, to challenge our embedded assumptions. Instead of returning to education as usual, we might gain insights through this disruption and continue to challenge our thinking and take advantage of "pandemic possibilities" (Schwartzman, 2020, p. 513). We share three assumptions that we challenge and through this process reflect on *what matters* in design thinking online.

Challenging assumption 1: Online experiences need to be compared and measured against in-person experiences

Design thinking spaces are imperfect wherever they are. The online experience was different from the traditional face to face experience associated with design thinking; it provided new benefits and new ways of working. The online-offline dichotomy is artificial, and thinking about it in this way revealed our prior assumptions about online teaching and learning. Learning need not be in the same physical space to have "embodied, emotive experiences" (Fawns et al., 2019, p. 296). In fact, design thinking online opens more space for diverse voices to be heard, and participants may be less likely to be influenced by a person's stature online. We need to design and lead online classes with a positive mindset to expand design thinking practices. Design thinking online loses some of the sensory affordances of in-person collaboration, yet educators can celebrate and experiment with the different possibilities of online spaces for learning, such as text chat as a back channel to discussion.

We can help students adapt to the tools available but also help them to understand constraint as a creative possibility. Empathy, enthusiasm and presence are more important in facilitating an engaging environment if classes are geographically separate. At the same time, educators should recognise the realities of students' lives and those around them. Design thinking online helps students to participate and makes it possible to connect with a wider community beyond the university ('getting out of the building'). The social construction of a new and inclusive learning space for design thinking online could be an exciting educational direction (Low, 2009). We recommend that educators experiment and be creative with the teaching and learning possibilities in an online environment, rather than seeing it as 'less than' an in-person experience.

Challenging assumption 2: Technology is at the centre of design thinking online

If we are honest about the way higher education is designed and delivered, there is unrealised potential to experiment with teaching and learning in a far more agile way. Design thinking is about people, not technology. It does not 'happen' online or physically, but where the learners are.

We often require students to fit into pre-existing and rigid educational technologies to fit the scale of a university instead of centering student needs. Design thinking principles can assist educators in encouraging *learning by doing* (think 'get outside') and fostering enthusiasm. Less tangible but equally (and sometimes more important) aspects can be taken for granted, such as the 'care and try' approach and facilitating social connections.

As educators we should be open to adapting and personalising the learning experience, rather than replicating current practices and processes. Design thinking online offers an opportunity to insist on placing humans at the centre of our practice, however and wherever that may be. Educational technology is evolving and imperfect; what matters is centering students (think 'care and try').

Challenging assumption 3: We should aim for 'best practice' in design thinking online

The strengths of design thinking online lie in qualitative and empathetic continuous experimentation and iteration. Bandera and colleagues (2020) highlighted that the value of the studio model is in its localised and contextual understanding, yet design thinking pedagogies in higher education often consider international, high profile models as best practice.

Rather than 'best practice' teaching approaches, we might instead draw inspiration from the methods of design thinking itself: a sense of curiosity and interaction, a cycle of learning and reflection, and willingness to do better next time. More research and experimentation are needed in a higher education context, rather than following a few established design thinking models. We might harness our own design thinking strengths and share diverse local learning and practice, whether on-campus, online, or somewhere in between. Educators, whether new to online learning or design thinking, are advised to seek connections and community to understand and iteratively improve their practice, as the authors of this article have.

The process of collaboratively writing this paper was revealing. Our reflections helped us to make sense of our raw experiences. In fact, as uncomfortable as it may be, we need to acknowledge that online design thinking pedagogy is still emerging outside of design studios and leave the discussion of 'best practice' to rest on the shelf. A mindset of being 'at the beginning' is helpful as it transforms how we think about what's possible. We encourage educators to experiment, support their learners through empathy, and create a space that is conducive to collaboration and reflection.

Conclusion

This paper shares our professional perspectives and reflections on the experience of approaching design thinking online. While our practice and reflections were situated in a response to a pandemic, we believe that our insights illustrate a range of local experiences and assumptions that are valuable to share with other educators in a post-pandemic environment. 'Best practice' can be a mirage when educators are thirsty for solutions. The shift to online learning is accelerating, and higher education practitioners can adapt their approach to design thinking in response to this period of significant change and disruption. There is more to explore in this emergent space, where we are sure to see increased opportunities for exploring blended and hybrid approaches to education. Our study challenges educators to reflect on their own practice and prompts further qualitative research on design thinking practices and mindsets in localised contexts.

References

Bandera, C., Somers, M., Passerini, K., Naatus, M. K. & Pon, K. (2020). Disruptions as opportunities for new thinking: Applying the studio model to business education. *Knowledge Management Research & Practice*, 18(1), 81-92. https://doi.org/10.1080/14778238.2019.1621225

Barry, D. & Meisiek, S. (2015). Discovering the business studio. *Journal of Management Education*, 39(1), 153-175. https://doi.org/10.1177/1052562914532801

Beligatamulla, G., Rieger, J., Franz, J. & Strickfaden, M. (2019). Making pedagogic sense of design thinking in the higher education context. *Open Education Studies*, 1(1), 91-105. https://doi.org/10.1515/edu-2019-0006

Blank, S. (2010, March 11). *Teaching entrepreneurship – by getting out of the building*. Steve Blank Entrepreneurship and Innovation. https://steveblank.com/2010/03/11/teaching-entrepreneurship-%e2%80%93-by-getting-out-of-the-building/

Boling, E., Siegel, M. A., Smith, K. M. & Parrish, P. (2013). Student goes on a journey; stranger rides into the classroom: Narratives and the instructor in the design studio. *Art, Design & Communication in Higher Education*, 12(2), 179-194. https://doi.org/10.1386/adch.12.2.179_1

Borton, T. (1970). *Reach touch and teach: Student concerns and process education*. McGraw-Hill.

Bourdieu, P. (1989). Social space and symbolic power. *Sociological Theory*, 7(1), 14-25. https://doi.org/10.2307/202060

Brown, A. H. & Green, T. D. (2018). Beyond teaching instructional design models: Exploring the design process to advance professional development and expertise. *Journal of Computing in Higher Education*, 30(1), 176-186. https://doi.org/10.1007/s12528-017-9164-y

Brown, C., Poortman, C., Gray, H., Ophoff, J. G. & Wharf, M. (2021). Facilitating collaborative reflective inquiry amongst teachers: What do we currently know? *International Journal of Educational Research*, 105, 101695. https://doi.org/10.1016/j.ijer.2020.101695

Clarke, R. I., Amonkar, S. & Rosenblad, A. (2020). Design thinking and methods in library practice and graduate library education. *Journal of Librarianship and Information Science*, 52(3), 749-763. https://doi.org/10.1177/0961000619871989

Cross, N. & Holden, G. (2020). Design education in the open. *Open Arts Journal*, 9, 149-161. https://doi.org/10.5456/issn.2050-3679/2020w10

Crowther, P. (2013). Understanding the signature pedagogy of the design studio and the opportunities for its technological enhancement. *Journal of Learning Design*, 6(3), 18-28. https://doi.org/10.5204/jld.v6i3.155

Das, A. K., Nguyen, Q. T., Nguyen, A. T., Nomikoudis, M. & Dung, H. V. (2019). Course redesign to incorporate flipped delivery: A business degree case in Vietnam. *Issues in Educational Researc*h, 29(2), 363-383. http://www.iier.org.au/iier29/das.pdf

Dawbin, B., Sherwen, M., Dean, S., Donnelly, S. & Cant, R. (2021). Building empathy through a design thinking project: A case study with middle secondary schoolboys. *Issues in Educational Research*, 31(2), 440-457. http://www.iier.org.au/iier31/dawbin.pdf

Dorst, K. (2011). The core of 'design thinking' and its application. *Design Studies*, 32(6), 521-532. https://doi.org/10.1016/j.destud.2011.07.006

Driscoll, J. (1994). Reflective practice for practise. *Senior Nurse*, 14(1), 47-50. https://pubmed.ncbi.nlm.nih.gov/8303152/

Dunne, D. & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, 5(4), 512-523. https://doi.org/10.5465/amle.2006.23473212

Fawns, T., Aitken, G. & Jones, D. (2019). Online learning as embodied, socially meaningful experience. *Postdigital Science and Education*, 1(2), 293-297. https://doi.org/10.1007/s42438-019-00048-9

Fenwick, T., Edwards, R. & Sawchuk, P. (2011). Emerging approaches to educational research: Tracing the socio-material. In *Emerging approaches to educational research* (1st ed., pp. 68-85). Routledge. https://www.routledge.com/Emerging-Approaches-to-Educational-Research-Tracing-the-Socio-Material/Fenwick-Edwards-Sawchuk/p/book/9780415570923

Fleischmann, K. (2019). From studio practice to online design education: Can we teach design online? *Canadian Journal of Learning and Technology / La Revue Canadienne de l'apprentissage et de La Technologie*, 45(1). https://www.learntechlib.org/p/208589/

Fleischmann, K. (2020). Hands-on versus virtual: Reshaping the design classroom with blended learning. *Arts and Humanities in Higher Education*, 20(1), 87-112. https://doi.org/10.1177/1474022220906393

Glen, R., Suciu, C. & Baughn, C. (2014). The need for design thinking in business schools. *Academy of Management Learning & Education*, 13(4), 653-667. https://doi.org/10.5465/amle.2012.0308

Hoon, C. H., Mighty, J., Roxå, T., Sorcinelli, M. D. & DiPietro, M. (2019). 'The danger of a single story:' A reflection on institutional change, voices, identities, power, and outcomes. *International Journal for Academic Development*, 24(2), 97-108. https://doi.org/10.1080/1360144X.2019.1594239

Jones, D., Lotz, N. & Holden, G. (2017). Lurking and learning: Making learning visible in a Virtual Design Studio. In G. Pritchard & N. Lambert (Eds.), *Proceedings of the LearnX Design London 2017 Conference* (Vol. 3, pp. 176-183). https://core.ac.uk/reader/146489950

Kimbell, L. (2011). Rethinking design thinking: Part I. *Design and Culture*, 3(3), 285-306. https://doi.org/10.2752/175470811X13071166525216

Kimbell, L. (2012). Rethinking design thinking: Part II. *Design and culture*, 4(2), 129-148. https://doi.org/10.2752/175470812X13281948975413

Koh, J. H. L., Chai, C. S., Wong, B., & Hong, H.-Y. (2015). Design thinking and education. In J. H. L. Koh, C. S. Chai, B. Wong & H.-Y. Hong (Eds.), *Design thinking for education: Conceptions and applications in teaching and learning* (pp. 1-15). Springer. https://doi.org/10.1007/978-981-287-444-3_1

Lloyd, P. (2013). Embedded creativity: Teaching design thinking via distance education. *International Journal of Technology and Design Education*, 23(3), 749-765. https://doi.org/10.1007/s10798-012-9214-8

Low, S. M. (2009). Towards an anthropological theory of space and place. *Semiotica*, 2009(issue 175), 21-37. https://doi.org/10.1515/semi.2009.041

Luca, E. J. & Narayan, B. (2016). Signage by design: A design-thinking approach to library user experience. *Weave: Journal of Library User Experience*, 1(5). https://doi.org/10.3998/weave.12535642.0001.501

Luca, E. J. & Ulyannikova, Y. (2020). Towards a user-centred systematic review service: The transformative power of service design thinking. *Journal of the Australian Library and Information Association*, 69(3), 357-374. https://doi.org/10.1080/24750158.2020.1760506

Matthews, M. T., Williams, G. S., Yanchar, S. C. & McDonald, J. K. (2017). Empathy in distance learning design practice. *TechTrends*, 61(5), 486-493. https://doi.org/10.1007/s11528-017-0212-2

McLaughlan, R. & Lodge, J. M. (2019). Facilitating epistemic fluency through design thinking: A strategy for the broader application of studio pedagogy within higher education. *Teaching in Higher Education*, 24(1), 81-97. https://doi.org/10.1080/13562517.2018.1461621

Meisiek, S., de Monthoux, P. G., Barry, D. & Austin, R. D. (2016). Four voices: Making a difference with art in management education. In C. Steyaert, T. Beyes & M. Parker (Eds.), *The Routledge companion to reinventing management education* (pp. 330-341). Routledge. https://doi.org/10.4324/9781315852430

Mintrop, R. & Zumpe, E. (2019). Solving real-life problems of practice and education leaders' school improvement mind-set. *American Journal of Education*, 125(3), 295-344. https://doi.org/10.1086/702733

Mosely, G., Wright, N. & Wrigley, C. (2018). Facilitating design thinking: A comparison of design expertise. *Thinking Skills and Creativity*, 27, 177-189. https://doi.org/10.1016/j.tsc.2018.02.004

Razzouk, R. & Shute, V. (2012). What is design thinking and why is it important? *Review of Educational Research*, 82(3), 330-348. https://doi.org/10.3102/0034654312457429

Schwartzman, R. (2020). Performing pandemic pedagogy. *Communication Education*, 69(4), 502-517. https://doi.org/10.1080/03634523.2020.1804602

Sheffield, R., Blackley, S. & Moro, P. (2018). A professional learning model supporting teachers to integrate digital technologies. *Issues in Educational Research*, 28(2), 487-510. http://www.iier.org.au/iier28/sheffield.pdf

Stanford d.school (n.d.). *The 5 Chair Challenge*. Hasso Plattner Institute of Design at Stanford University. https://dschool.stanford.edu/resources/the-5-chair-challenge

Taylor, S. S. & Statler, M. (2014). Material matters: Increasing emotional engagement in learning. *Journal of Management Education*, 38(4), 586-607. https://doi.org/10.1177/1052562913489976

Vallis, C. & Redmond, P. (2021). Introducing design thinking online to large business education courses for twenty-first century learning. *Journal of University Teaching & Learning Practice*, 18(6), 213-234. https://doi.org/10.53761/1.18.6.14

Welsh, M. A. & Dehler, G. E. (2013). Combining critical reflection and design thinking to develop integrative learners. *Journal of Management Education*, 37(6), 771-802. https://doi.org/10.1177/1052562912470107

Yorgancioğlu, D. (2020). Critical reflections on the surface, pedagogical and epistemological features of the design studio under the "new normal" conditions. *Journal of Design Studio*, 2(1), 25-36. https://doi.org/10.46474/jds.744577

Sandris Zeivots *PhD* is a Lecturer in Educational Development with Business Co-Design unit at the University of Sydney Business School. He investigates how to design innovative learning experiences that are engaging, meaningful and purposeful. With a professional background in experiential learning, Sandris explores impactful educational events through learning spaces, experiential education and emotional engagement.
ORCID: https://orcid.org/0000-0001-5450-2530
Email: sandris.zeivots@sydney.edu.au, sandris.zeivots@gmail.com

Carmen Vallis is a Lecturer in Educational Development with Business Co-Design unit at the University of Sydney, Australia. She is a PhD candidate studying creative writing and practice who is passionate about the intersection of creativity, design and all things digital in higher education.
ORCID: https://orcid.org/0000-0003-0143-4145
Email: carmen.vallis@sydney.edu.au

Catherine Raffaele has spent the past decade as a researcher of emerging work and learning practices. Over the last five years, she has designed and taught design thinking and entrepreneurial programs across multiple disciplines at undergraduate and postgraduate levels.
Email: catherine.raffaele@uts.edu.au

Edward J. Luca is a library practitioner and researcher. He is currently Associate Director, Academic Services at the University of Sydney Library. Edward writes and speaks on topics including design thinking, academic librarianship and scholarly publishing. He is also undertaking his PhD in the discipline of Business Information Systems at the University of Sydney Business School.
ORCID: https://orcid.org/0000-0001-6604-2463
Email: edward.luca@sydney.edu.au

Please cite as: Zeivots, S., Vallis, C., Raffaele, C. & Luca, E. (2021). Approaching design thinking online: Critical reflections in higher education. *Issues in Educational Research*, 31(4), 1351-1366. http://www.iier.org.au/iier31/zeivots.pdf