Co-design as Professional Learning: Pulling Each Other in Different Directions, Pulling Together

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Abstract How best to support active and engaging online learning and teaching in higher education? Increasingly sophisticated professional skills associated with technological, pedagogical, and content knowledge, supported by an integrated team approach, are required. The social and dialogical process of co-design can erode barriers to engaging with new pedagogical approaches to online learning. By 'pulling each other in different directions', multidisciplinary teams learn from each other, and learn how to 'pull together' to improve student learning experience and outcomes in higher education. Reconceptualising teaching and learning through such co-design is an ongoing emergent process, rather than an incremental series of events. Yet the nuance of how more active online teaching practices emerge from such professional co-design processes is little understood. Frameworks for measuring and understanding the professional development impact of co-design, as well as models for sustainable collaboration, are needed.

This chapter outlines a continuing professional learning and development (CPLD) approach to active online teaching from a co-design perspective, which draws on a design-based research framework to support skills in designing, developing, teaching, and evaluating diverse business subjects. Insights and recommendations for those leading and participating in collaborative design projects are presented.

1 Introduction

Co-design is a facilitated, collaborative process in which team members work together to design an educational innovation. As part of this process, prototypes are developed and evaluated based on their effectiveness in addressing an educational need (Roschelle et al., 2006). The process of co-designing courses and curricula is

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increasingly seen as an opportunity for professional learning and has the potential to support teachers in learning to teach online (Voogt et al., 2015). Such continuing professional learning and development (CPLD) involves collaborative, interdisciplinary design processes in authentic contexts and mirrors the principles of designing for student-centred active learning experiences (Ertmer & Newby, 2016; Laurillard, 2009).

Yet higher education teaching is traditionally an autonomous activity. Curriculum design and course development are often contingent on individual, academic skill, capability, and capacity (McGee, 2014). Such learning design and teaching are highly context dependent, and educators' intrinsic beliefs about learning are more likely to influence practice than pedagogical research (Bennett et al., 2015). Sharing learning designs, teaching methods, and teaching activities is uncommon due to time constraints, resistance to change, and sometimes a lack of knowledge, apart from early adopters and innovators (Cameron, 2017).

In contrast, our co-design process with educators is grounded in learning through a Community of Practice (Cochrane & Narayan, 2013). Over time, professional development emerges out of social learning and developing competence through shared experience and a shared culture (Wenger, 2000). Shifting to a multidisciplinary, co-design team approach is a substantial cultural and social change. An investment of time and commitment is needed to reap the benefits of collaborative professional learning in teams and truly create change (Burrell et al., 2015). While co-design has not been used widely to support strategic pedagogical change in Business Schools, it has been used in a variety of ways in higher education (Wilson et al., 2021).

In co-design processes, team members gain skills and a sense of ownership through interacting with peers and multidisciplinary experts and by negotiating the design and development (Voogt et al., 2015). Much of the process draws on iterative design systems such as Engeström's expansive learning cycle (2011), design-based research, and the design inquiry framework (Mor & Mogilevsky, 2013). Indeed, co-design revolves around iteration and redesign, which is central to effective design (Goodyear & Dimitriadis, 2013).

Such creative collaboration from diverse perspectives necessarily involves an open communication and willingness to persist beyond inevitable misunderstandings and creative tensions and mismatched levels of readiness to participate. As part of this multidisciplinary collaboration, team members share goals and gather and evaluate the impacts of this different teaching and learning design culture (Barber, 2015). Reflecting upon these findings is also a critical part of the process to embrace diverse perspectives and contributions (Beacham & Shambaugh, 2013).

However, collaborative approaches to educational design are ill-defined, and this ambiguity can be both exciting and uncomfortable for all involved (Bower, 2017). Co-design projects can fall apart unless team members pull together. Hence, in this study, we ask, How may a co-design approach and its creative tensions support professional learning and more active online teaching practices?

By investigating our co-design process and its outcomes, we present recommendations for optimising professional learning through practical immersion in co-design. Our course development practice builds on the concept of situated learning

to situate CPLD in the context of online teaching and learning with its unique affordances and constraints (Collins & Greeno, 2010). We argue that co-design can be refined and studied with models such as Drain and Sanders (2019)'s Participatory Design Collaboration System Model (CSM), discussed later in the chapter, to increase the quality of collaboration and ultimately professional learning.

1.1 Connected Learning at Scale

The co-design practice described in this chapter is part of a large strategic project at the University of Sydney Business School called 'Connected Learning at Scale' (CLaS). The project aims to transform the teaching and learning experience in our large undergraduate and postgraduate core subjects. It is intended to better manage and leverage the scale of cohort and to support, nurture, and leverage connections between students, disciplines, industry, and society. One of the guiding principles of the CLaS project is to increase opportunities for students to actively engage with discipline knowledge online as opposed to having it 'delivered' to them in a lecture. Figure 1 shows the five phases of the design-based research process used to implement CLaS principles.

The co-design process in CLaS projects typically unfolds over three iterative cycles across three semesters. Over the course of approximately a year and a half, these development cycles loosely follow the stages of design, plan, build, implement, and evaluate, as shown in Fig. 1.

The first cycle of development begins with an intensive exploration of ideas, planning, and design. An educational developer meets with the business academic (the subject coordinator) to scope, plan, and discuss the design principles and phases of the CLaS project and provide pedagogical advice (Bryant, 2022). A multidisciplinary team is formed for all subjects involved in CLaS projects. An educational developer leads the project and coordinates a team of learning design and media professionals, along with a researcher who evaluates interventions. In this critical early stage of a CLaS project, the educational developer facilitates 'Connect:IN' workshops where the business teaching team and other stakeholders (such as tutors, students, and industry members) suggest areas to enhance the subject design. This co-design process with a diverse team addresses educational challenges arising from the authentic, increasingly complex business skills and knowledge required of students (Vallis & Redmond, 2021).

The project team negotiates a design and development plan, with the subject coordinator and teaching team contributing content, assessment, and ongoing feedback. Media assets and digital learning sequences are built and tested, and appropriate learning tools and technologies, often new to the subject, are integrated to meet educational requirements. Throughout this process, academics learn by collaborating with the multidisciplinary team and are supported with guides, resources, and DIY multimedia kits as needed.

Evaluation data are collected for each phase or semester, with a combination of surveys, focus groups, interviews, and class or space observations where relevant.

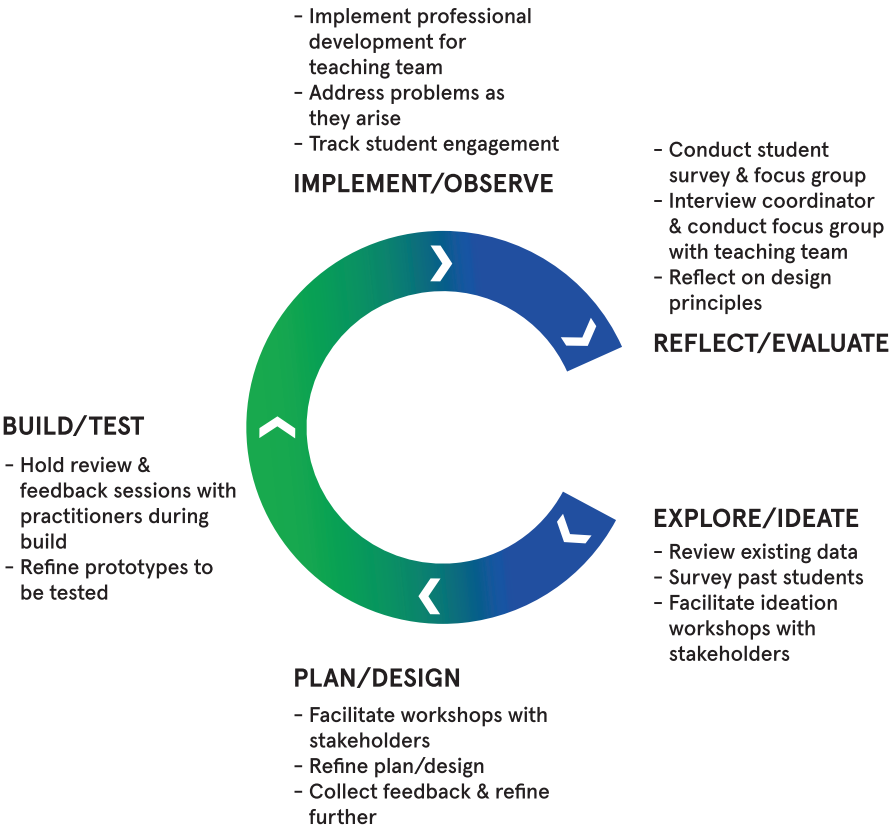

Fig. 1 CLaS design and development cycle

The evaluation is co-designed with business academics and other relevant stakeholders to align with educational research as an accountability measure and to support evidence-based changes.

Similar to the approach described in Barbera et al., (2017), the co-design process is embedded in design-based development and research to connect theory and practice. Learning interventions are designed and evaluated in practice – in collaboration with practitioners and in naturalistic settings – helping bridge the theory and practice gap to create transferable knowledge that is useful in different teaching contexts. Hence, our educational development is guided by iterative cycles of collaborative design, prototyping learning designs, and implementing and evaluating new teaching and learning approaches at strategic points in the development cycle (Wang & Hannafin, 2005). We propose educational co-design as a process of connecting people, rather than a task. Co-design connects the different design elements and teams as a whole and provides a focus on pedagogical design for learning and teaching. Figure 2 illustrates this process by mapping the stakeholder configurations and learnings across the co-design phases.

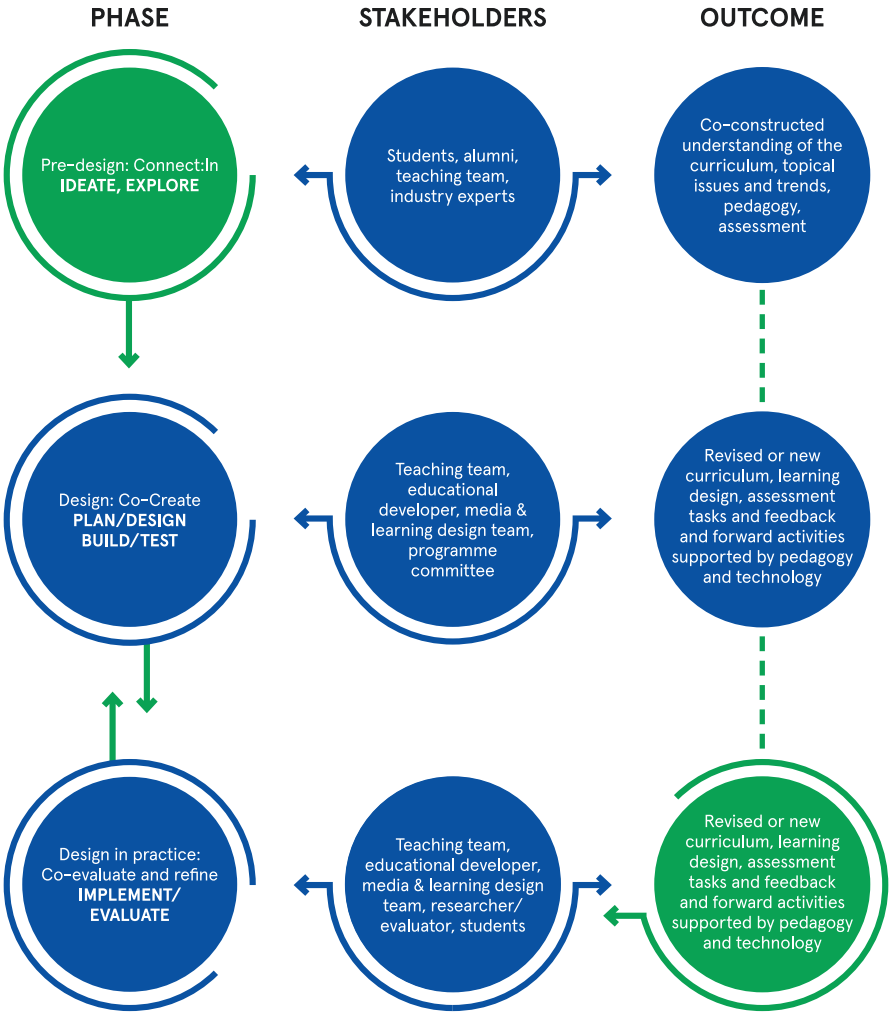

Fig. 2 Educational co-design as a connected process

2 Method

We routinely endeavour to understand the perspectives of business academics on collaborative professional learning and development through semi-structured interviews in accordance with the University's Ethics Committee [2019/892]. Questions prompt academics to reflect on their perceptions of co-design, both positive and negative, as well as the impact of collaboration on the development of their teaching practice. These interviews are conducted by research associates so that the professional relationship between the educational developers and academics has less influence on the scope of the discussions.

For this study, we also interrogated our own practice as educational developers and how it might support professional learning through a reflective conversation. Critical reflection is crucial to design-based research and to understand the professional learning that arises from co-design. This conversation was based on a series of self-reflection prompts, devised from our ongoing discussions about the role of educational developers in relation to core research questions (Driscoll, 2007).

After thematically analysing both data sets (recordings of academic interviews and the educational developer reflective conversation), we inductively coded and interpreted the findings as a group (Huberman & Miles, 2002). Finally, coded data were re-analysed for patterns and relationships that directly supported the research question of evidence of professional learning emerging from co-design.

3 Pulling Each Other in Different Directions

Three overarching themes emerge in our analysis. Co-design as professional learning and development necessarily pulls us in different directions, as academics and educational developers. In our professional lives, we often work in silos. Yet learning and change through co-design requires working together to learn about design itself. Attitudes to design also impact professional learning and development, particularly a disposition to collaborate and sustain effort through inevitable tensions. Our research indicates that sharing products and evaluation in and across teams can help us pull in the same direction together. Professional learning is strongly linked to reflecting on how to tease apart these inevitable tensions, as one senior educational developer noted in reflecting on the co-design process with discipline academics:

> What is this tension? Where's it coming from? How do we manage it? And then how do we actually benefit from this tension?

3.1 Learning About Design

Professional learning and development through co-design was strongly influenced by time management and competing priorities, which created tensions. At various times of the university calendar, academics' attention was divided or directed to other activities, and co-design was hurried, inhibiting both course development and professional learning. For example, where online content was developed week-by-week, design and development was compressed into short lead-times. It then became difficult to review and holistically appraise learning design in rapid development cycles, and academics expressed some frustration at what was perceived as a rushed process.

However, team members who committed to the time and effort needed to coordinate and produce quality support for online learning demonstrated evidence of professional learning related to the co-design process. Academics gained designer knowledge, practical insights into working with a production team, and the exigencies of lead-times and development cycles, which differ from traditional classroom teaching that follows a weekly semester schedule. Professional learning and development was cumulative, gained with repetition and practice across many weeks. Academics became more skilled in creating engaging multimedia by learning to present to camera over several filming sessions. In successful projects, it took several weeks for the team to understand each other's design needs and timeframes, sometimes longer. For example, a subject coordinator of a large postgraduate first-year Finance subject flagged that

> It started from a point of great uncertainty as to how we would all work together, through to almost a well-oiled machine. But it probably took about six weeks to understand … particularly referring to the online asynchronous material … to get the thing running where we understood how each other worked. I don't think that's unusual with any sort of audio-visual world. But it's running smoothly now.

The process of creating and reviewing online content was also considered cumbersome when team members were unused to design as a process. Educational developers and learning designers were not subject matter experts, so content changes could not "magically appear." Yet, with hindsight, academics sometimes acknowledged the benefit of team members with different strengths. For example, learning designers helped them understand how to effectively chunk and sequence content to engage students more actively with concepts in an online environment.

Lack of time, combined with the push and pull of co-designing as a team, could generate complex, creative tension around processes and control. Educational developers continuously questioned their own assumptions about how to design for learning with team members. On the other hand, academics expressed tension about what they perceived as an imposed design, which had to be articulated and worked through until the team arrived at a shared vision. Such tensions around creative control were sometimes resolved upon examining evidence of benefits for students when positive results could be seen. Through this process, academics learned about design consistency and user experience across subjects, whereas before they had become "tethered" to their own designs. For example, a tutor in a core undergraduate subject in business leadership thought it important to

> embed the broader vision … and just let go of some of our own design ideas but working together. I mean because unless we see a vision of something that we haven't seen before – to be able to help us – I feel like it's really upgraded the content … So just in that collaboration … And you know, we just worked through that, had our views about it and then it started to make sense.

Misunderstanding team members' strengths and roles led to tension but also group learning. Testing each other's assumptions and asking challenging questions could lead to positive turning points in professional development. In one instance, mounting tension was only resolved when the team acknowledged that the

co-design workflow was not working and mutually agreed a way to improve it, eventually resulting in deeper trust and a more productive and creative output for students. Through these stronger relationships, the team felt safe to trial and innovate an educational technology to collect weekly reflections and send students personalised learning messages.

3.2 Attitudes to Design

Professional learning through co-design was contextual and adapted to individual practice. Academics drew on their own experiences and expectations of what teaching means at university, which sometimes meant working with (and around) unclear policy and procedure and ingrained institutional practices.

Beyond a common desire to create the best possible learning experience, co-design worked well when all acknowledged that developing large-scale courses is complex and needs a collaborative team effort, particularly as class sizes in higher education are likely to continue to increase. Most academics teaching large classes found professional learning in this context inherently more challenging, although one academic was inspired to greater pedagogical creativity.

Busy business academics appreciated team support and project management, technical assistance, and pedagogical advice from educational developers and the learning design and media professionals. Co-design processes and templates for designing and developing active learning online content were also considered helpful.

By contrast, educational developers discussed being mindful of processes with "gentle" facilitation to steer the team towards different possibilities in teaching and learning. Framing conversations around redesign from a student's point of view helped influence better learning outcomes. Above all, educational developers highlighted the authentic and situated nature of professional learning with academics in multidisciplinary teams as

> learning by doing, by being immersed in a different culture and context, and really grappling with the problems in that culture and context …

In general, respect for often conflicting demands, compromise, and choosing the right moments to suggest changes helped build mutual trust. Building strong co-design relationships meant remaining positive in stressful times and an investment of resilience and energy. Indeed, one project team with previous experience working together found they could create a team culture and pride in their collaborative process through weekly meetings, technical support, and frequent communication, and differences of opinion were embraced, regardless of status. The subject coordinator of this first-year postgraduate marketing unit described their co-design as

> It just feels like boots and all, everyone just gets in and jumps in and does what needs to be done and helps each other out in that process.

3.3 Sharing Co-design in and Across Teams

Time and organisational constraints, tensions around creative process and control, combined with sometimes ambivalent attitudes to co-design, contributed to knowledge gaps and misunderstandings. However, these could be bridged by sharing teaching and learning practice and evidence within teams and across disciplines. Despite challenges such as patchy communication across teams and disciplines (which in some cases meant that academics were unaware of professional learning opportunities such as training workshops), co-design was considered an opportunity to traverse these organisational silos, even if such work was slow and fraught at times. Differing roles and views could sometimes provoke reflection on separate but complementary perspectives (Vallis & Lopomo Beteto, 2022).

Sharing practice to push beyond individual course development emerged as a key affordance of professional learning in co-design. Immediate positive practical impacts included sharing, re-using, and adapting videos and interactive activities across subjects. Seeing others' course development and products inspired academics to change their own practice or sparked new ideas. Diverse and fresh perspectives from working with a multidisciplinary team were noted as stimulating "ideas that I haven't thought of before." Suggestions on how to present certain concepts, or how to interact with students online, were valued. Knowledge gaps in technology were also bridged. Academics were exposed to new educational technologies through co-design, creating tangible opportunities for learning and changing their teaching practice. They particularly benefited from technical upskilling in areas such as media production and online learning design. This positive impact rippled out to other subjects as academics applied active online practices to other teaching contexts.

The skills and experience academics gained by collaborating on projects with diverse roles, timeframes, and processes were different from their usual teaching or research. Co-design also highlighted the need for embedded professional development. For example, one academic wanted to learn content authoring tools to create and edit interactive activities to take greater ownership of the design and development process in the future.

As evaluation is built into co-design, team members had opportunities to collectively reflect on evidence and practice to re-think student learning, which in turn facilitated more creative and reflective practice in a business leadership teaching team.

> I'm a bit more intentional in the way that I will teach. Rather than 'here's my content …' so I feel like that has changed in a good way.

Through collectively analysing evaluation data, team members learnt what aspects of online learning design were effective. Formative data provided evidence of whether students completed online pre-work activities, for example, and whether the activities contributed to learner engagement. For the same teaching team, more

accustomed to observing student behaviour in a classroom setting, understanding student responses to the newly developed online modules was illuminating.

> We do know that something good is happening, just looking at the data … It feels organised, the design is – everything just seems to be consistent and flowing. So we're getting a lot of qualitative comments from students that we're not even asking about, but they're noticing that they really are enjoying the online experience.

Team members learnt much about the shift to online learning by interrogating the qualities of different learning environments. Academics had cause to reflect on whether core concepts were more effectively learnt online or through verbal presentations, among other teaching strategies. Asking these kinds of questions is fundamental to CPLD and provokes further conversations and initiatives around student learning. For example, academics realised that designing and developing online asynchronous experiences could free up time in synchronous classes for more student-centred active learning (Kim et al., 2014). Student engagement in asynchronous online activities needed re-designing:

> It's a 24/7 cycle. It's a different way of thinking. It's understanding that students are not only learning within the tutorial once a week for an hour and a half … And so … we need to build the unit and approach our teaching in that way.

Approaching development through co-design helped some academics re-think and revisit teaching assumptions, especially important in shifting from campus-based to online learning. It meant reappraising how online teaching could be active, where before "we were just like transmitting, throwing information" at students. Academics were exposed to design ideas outside of their discipline as, "in your own teaching team doing the same thing, delivering, you know your content, so you do become insular." Another subject coordinator, with no experience teaching online at the time of the interview, conceded that although their pedagogical approach was perhaps more old-fashioned than others in the co-design team, they realised, "maybe students learn in different ways." This augurs well for future developments.

At the other end of the spectrum, teachers adept in online skills felt "energised" to further creatively experiment with active teaching and learning strategies. Co-design gave innovators opportunities to spread their teaching wings.

4 Discussion: Pulling Together

This chapter set out to investigate how teachers may be supported in learning to teach online using a co-design development process (see Fig. 1). Findings suggest there are multiple ways that co-designing in multidisciplinary teams can support professional learning. However, learning through co-design may be negatively impacted under certain conditions, for example, if process and organisational culture are misaligned, or timelines are too constrained, resulting in onerous workloads and limited reflection.

Tensions can also be linked to a lack of experience in co-design and educational development practices. Such practices include working in a multidisciplinary team rather than individually; engaging in design-based and research-led approaches to curriculum development rather than content-driven approaches; and working in an arena where educational designs, methods, ideas, and artefacts are shared more broadly (Bennett et al., 2015; Cameron, 2017; McGee, 2014). As Bower, (2017) notes, tensions may be amplified by the inherently ambiguous nature of the design. We found roles were not always clear, particularly in the early stages, and this led to some discomfort. Nevertheless, educational developers and academics acknowledged that these frustrations could lead to professional learning development and hence better educational outcomes for students.

Co-design, often unsettling at first, is what eventually brings the team together. Because roles and processes are ill-defined, the team has to work together to create a culture, routine, and all the fundamental attributes that define an effective and productive team. These processes create a space for the team members to build trust, respect, and a mutually agreed but emergent set of guidelines for working together – this is sustained professional development and learning that is robust and refocuses when an unforeseen challenge or issue arises.

Consistent with a design-based research approach, each iteration of development in the subjects associated with this study has been comprehensively evaluated. The data collected through student surveys and focus groups provide preliminary evidence that developments arising from the co-design process related to CLaS principles have enhanced student engagement. For the subjects that are still in development, the impact on further professional learning and the student experience remains to be seen. However, the end-of-semester student feedback surveys show an upward trend of student satisfaction in CLaS subjects, despite the considerable personal and academic challenges posed by the pandemic.

We argue that the situated nature of co-design (Collins & Greeno, 2010) has significant potential to support the kind of sustained professional learning that results in shifts in online learning and teaching, ultimately enhancing the student experience. A finance academic and coordinator acknowledged how co-design helped him to navigate the rapid pivot to online and remote learning due to COVID-19.

> So unlike other people who hadn't really had a lot of experience in trying to use some of this for teaching purposes, I felt that I was in a much better position because at least I had used a lot of this technology before … I think it's a really, very positive experience.

Academics acknowledged some of the benefits of working in a team with diverse perspectives and skills. While further longitudinal research is needed, it is suggested that participation in co-design will assist academics to coordinate the types of support they need to develop quality online learning in the future. Relationships formed during co-design projects may offer a system of support that was perhaps not previously felt or drawn upon. Mindsets around curriculum development may shift over time to reconceptualise it from an individual endeavour to a collaborative effort of colleagues with different perspectives and strengths. University teaching practice

may be perceived as a highly networked and distributed activity where new approaches are embraced, which include sharing the role with other people, systems, and tools (Mantai & Huber, 2021).

To maximise professional learning and development through co-design over time, we suggest more attention to the quality of the collaboration process. The themes found in our analysis were consistent broadly with Drain and Sanders' (2019) Participatory Design Collaboration System Model (CSM), which aids in planning and evaluating designer–participant collaboration. The three areas of the model – designer knowledge, collaboration and capacity building, and participant knowledge – are useful for pre-empting the kinds of issues identified in the current study that arise from misalignments between the design process and organisational culture. Focussing more attention on academics' capacity to participate, as well as on appropriate design environments and materials to support collaboration and capacity building, may create an overall environment more conducive to professional learning.

Reflecting on our study and findings, we make five recommendations for maximising professional learning through co-design:

1. Consider academic partners' capacity to participate fully in the process, including what might best support this (active capacity building, design activities, materials, environments, time).
2. Orient teams to design-based development and co-design as an evolving, messy, and ambiguous process that may generate creative tensions that often lead to innovative solutions and valuable professional learning for team members. Acknowledge that not knowing how and where we are going together is the starting point – building a plan and new knowledge together is what will get us to where we want to go.
3. Identify aspects of the organisational culture that are misaligned with the co-design process and how these might be mitigated.
4. Ensure there is sufficient time to collectively reflect on the co-design process, emergent designs, and evaluation data during and between iterations.
5. Develop and implement a transition process at the completion of the project, including specific training needed to sustain developments.

Those leading co-design processes in higher education need to be equipped to recognise and navigate the complex dynamics of teams that may support or hinder professional learning. While we acknowledge that our co-design process is part of a well-resourced strategic project with a multidisciplinary team, our recommendations are transferable and relevant to a range of collaborative teaching contexts. Future research could explore the perspectives of all team members involved in co-design to further understand how professional development emerges out of social learning and through shared experience and a shared culture (Wenger, 2000). These multiple perspectives would provide a 360° view of how co-design, with its complex collaborative processes and creative tensions, fosters professional learning where all team members pull together in the interests of students.

References

Barber, J. (2015). How to design for breakthrough. *Educational Designer, 2*(8) http://www.educationaldesigner.org/ed/volume2/issue8/article29/

Barbera, E., Garcia, I., & Fuertes-Alpiste, M. (2017). A co-design process microanalysis: Stages and facilitators of an inquiry-based and technology-enhanced learning scenario. *International Review of Research in Open and Distributed Learning: IRRODL, 18*(6), 104–126. https://doi.org/10.19173/irrodl.v18i6.2805

Beacham, C., & Shambaugh, N. (2013). Use of frame reflection and metadesign to guide curriculum development across design disciplines. *The International Journal of Design Education, 6*(3), 87–96. https://doi.org/10.18848/2325-128X/CGP/v06i03/38423

Bennett, S., Agostinho, S., & Lockyer, L. (2015). Technology tools to support learning design: Implications derived from an investigation of university teachers' design practices. *Computers and Education, 81*, 211–220. https://doi.org/10.1016/j.compedu.2014.10.016

Bower, M. (2017). Design thinking and learning design. In *Design of technology-enhanced learning* (pp. 121–158). Emerald Publishing Limited. https://doi.org/10.1108/978-1-78714-182-720171008

Bryant, P. (2022). Transforming Business Education Through Connected Learning - Part 3. *Co-Design Research Group*. https://cdrg.blog/2022/03/03/transforming-business-education-through-connected-learning-part-3/

Burrell, A. R., Cavanagh, M., Young, S., & Carter, H. (2015). Team-based curriculum design as an agent of change. *Teaching in Higher Education, 20*(8), 753–766. https://doi.org/10.1080/13562517.2015.1085856

Cameron, L. (2017). How learning designs, teaching methods and activities differ by discipline in Australian universities. *Journal of Learning Design, 10*(2). https://doi.org/10.5204/jld.v10i2.289

Cochrane, T., & Narayan, V. (2013). Redesigning professional development: Reconceptualising teaching using social learning technologies. *Research in Learning Technology, 21*(1). https://doi.org/10.3402/rlt.v21i0.19226

Collins, A., & Greeno, J. (2010). Situated view of learning. In *International encyclopedia of education* (pp. 335–339). Elsevier. https://doi.org/10.1016/B978-0-08-044894-7.00504-2

Drain, A., & Sanders, E. B. (2019). A collaboration system model for planning and evaluating participatory design projects. *International Journal of Design, 13*(3) http://www.ijdesign.org/index.php/IJDesign/article/view/3486/870

Driscoll, J. (2007). *Practising clinical supervision: A reflective approach for healthcare professionals* (2nd ed.). Bailliere Tindall.

Engeström, Y. (2011). Activity theory and learning at work. In *The SAGE handbook of workplace learning* (pp. 86–104). SAGE. https://doi.org/10.4135/9781446200940.n7

Ertmer, P. A., & Newby, T. J. (2016). Learning theory and technology. In *The Wiley handbook of learning technology* (pp. 58–76). Wiley. https://doi.org/10.1002/9781118736494.ch4

Goodyear, P., & Dimitriadis, Y. (2013). In medias res: Reframing design for learning. *Research in Learning Technology, 21*(1). https://doi.org/10.3402/rlt.v21i0.19909

Huberman, A. M., & Miles, M. B. (2002). *The qualitative researcher's companion*. SAGE.

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *The Internet and Higher Education, 22*, 37–50. https://doi.org/10.1016/j.iheduc.2014.04.003

Laurillard, D. (2009). Technology enhanced learning as a tool for pedagogical innovation. *Journal of Philosophy of Education, 42*(3–4), 521–533. https://doi.org/2008.00658.x

Mantai, L., & Huber, E. (2021). Networked teaching: Overcoming the barriers to teaching experiential learning in large classes. *Journal of Management Education*. https://doi.org/10.1177/1052562920984506

McGee, P. (2014). Blended course design: Where's the pedagogy? *International Journal of Mobile and Blended Learning, 6*(1), 33–55. https://doi.org/10.4018/ijmbl.2014010103

Mor, Y., & Mogilevsky, O. (2013). The learning design studio: Collaborative design inquiry as teachers' professional development. *Research in Learning Technology, 21*(1). https://doi.org/10.3402/rlt.v21i0.22054

Roschelle, J., Penuel, W. R., & Shechtman, N. (2006). Co-design of innovations with teachers: Definition and dynamics. In *Proceedings of the 7th international conference on Learning sciences, ICLS'06* (pp. 606–612). International Society of the Learning Sciences.

Vallis, C., & Lopomo Beteto, D. (2022). Another set of eyes: An educational co-design story. *International Journal for Academic Development*. https://doi.org/10.1080/1360144X.2022.2104854

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

Voogt, J., Laferrière, T., Breuleux, A., Itow, R. C., Hickey, D. T., & McKenney, S. (2015). Collaborative design as a form of professional development. *Instructional Science, 43*(2), 259–282.

Wang, F., & Hannafin, M. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development, 53*(4), 5–23. https://doi.org/10.1007/BF02504682

Wenger, E. (2000). Communities of practice and social learning systems. *Organization, 7*(2), 225–246. https://doi.org/10.1177/135050840072002

Wilson, S., Huber, E., & Bryant, P. (2021). Using co-design processes to support strategic pedagogical change in business education. In A. Kjaergaard, A. Lindgreen, E. Rosier, T. U. Thomsen, & A. Tuncdogan (Eds.), *How to undertake teaching and learning in business schools*. Edward Elgar.