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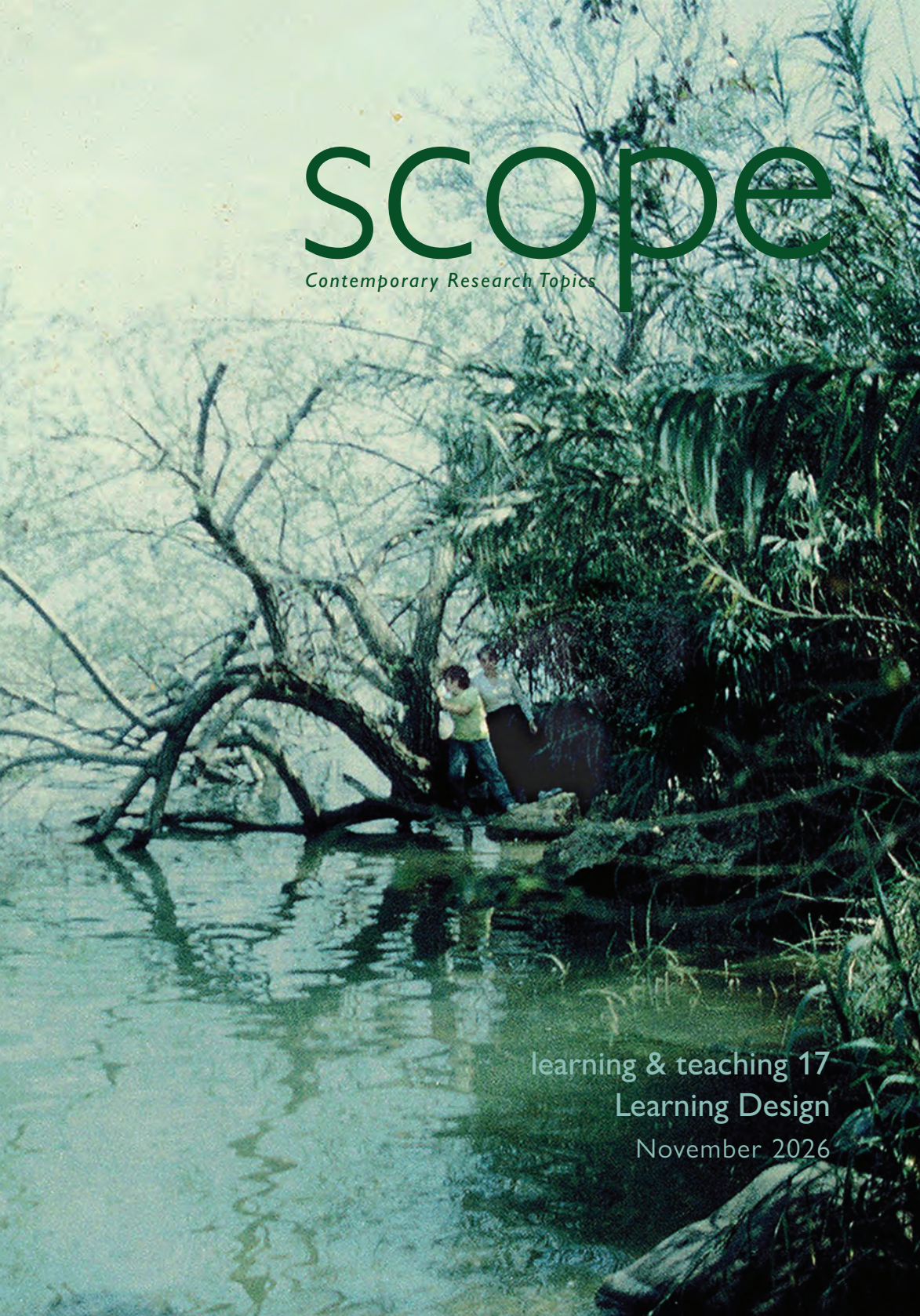
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LEARNING DESIGN: CREATING CONDITIONS FOR LEARNING

Daniel Fridberg and Amy Benians

Learning design begins with an inherent challenge: we cannot make a learner learn. We can explain, demonstrate, question, organise resources, provide feedback, and create opportunities to practise. We can do our best to remove some barriers, yet the question remains: how can we transfer knowledge intact from a teacher to a learner (and vice versa), or guarantee that a carefully designed activity will be experienced exactly as we intend? The skill set and knowledge required to improve our chances of achieving this are what make Learning Design an emerging profession in its own right.

Since learning cannot be guaranteed, learning design involves creating the optimal conditions in which it becomes more accessible, possible, and meaningful. These conditions integrate cognitive, emotional, and relational ingredients. First, on the cognitive side, learners need to connect new ideas with prior knowledge, manage complexity, consolidate understanding, and apply it in unfamiliar situations, appropriate to the level of their studies. On the emotional level, learners need to feel safe, supported, and appreciated. On the social level, learners need to be recognised for their social capital, their identities, and their unique contribution to the learning environment. Learning design may therefore be understood as the intentional organisation of tasks, resources, environments, and interactions, coupled with a willingness to revise those arrangements in response to experiences (Bennett et al., 2017; Goodyear, 2015).

The seven contributions in this special issue of *Scope (Learning and Teaching)* approach learning design from different angles. They move between theory and practice, reflection and empirical evaluation, Aotearoa New Zealand and international contexts, and face-to-face versus digitally mediated and simulated environments. Collectively, they review the different dimensions shaping the practice of learning design.

RELATIONAL AND TIRITI-GROUNDED DESIGN

Terri Brian and Jody Takimoana ground the special issue's relational and ethical foundation in "Te Ako Tētahi ki Tētahi Learning From One Another: The Power of Ako," through a recorded dialogue they conducted. Their kōrero explores key concepts around ako (reciprocal learning and teaching pedagogy in the Māori tradition), whanaungatanga (kinship-like relationships), mātauranga (knowledge) and tuākana-tēina (older-younger sibling) relations as interconnected components for learning design in Aotearoa. In this article, they discuss the dialogical form of learning design, starting with how understanding develops through questions, to clarification and movement between the positions of ākonga and kaiako. Ako, they argue, should not be reduced to the observation that educators occasionally learn from students. Rather, expertise is distributed and

roles may shift according to context. That is, kaiako retain pedagogical responsibilities without becoming the sole source of legitimate knowledge, while ākonga bring experiences and cultural understandings capable of extending or challenging what educators know (Pere, 1994).

Since such reciprocity depends on establishing whanaungatanga, and fostering relationships requires time and space, it cannot merely be listed among a course's values while in practice every opportunity for connection is missed in the interests of content coverage. Thus, relational pedagogy's value partly lies in making disagreement sustainable without making the relationship disposable (Berryman et al., 2018). Brian and Takimoana connect this work with te Tiriti partnership and with questions of power; that is, whose knowledge is foundational, who is expected to speak, and who is positioned as expert.

Rachael Burke's "Supporting International Tertiary Students in Aotearoa New Zealand Through Building Relationships and Fostering Belonging" translates these principles into teacher-education suggested guidelines, such as learning names accurately, sharing significant objects and life maps, introducing support staff face to face, and creating peer-learning relationships. These, she suggests, should be learning design decisions rather than congenial extras. Drawing on slow pedagogy and Māori models of wellbeing, Burke argues that belonging is a condition of participation. Specifically, Durie's Te Whare Tapa Whā framework (1994) broadens the design frame by treating physical, emotional, spiritual, and relational and cultural wellbeing as interconnected dimensions of readiness to learn.

COHERENCE, KNOWLEDGE, AND LEARNER EXPERIENCE

Roseanne Sadd, Colleen Reilly, Shirley Lyford, and Te Aniwa Wakem examine how ākonga perceive and experience the Bachelor of Nursing in "Students' Perspectives on a Bicultural Virtual Whānau: Advancing Te Tiriti o Waitangi in Nursing Curricula." In their learning design, learners are introduced to fictitious family members (whānau) who recur across simulations, tutorials, and assessments through successive years of the programme. As learning design artefacts, developing health narratives connect otherwise segmented curriculum elements and reduce the need to process an entirely unfamiliar situation in each activity, allowing ākonga to focus on increasingly complex clinical reasoning.

The study demonstrates why learning design must be evaluated from more than one standpoint. While ākonga generally regarded the virtual whānau as clinically realistic and useful, ākonga Māori identified stereotyping, the marginalisation of tikanga in task-focused simulations, the frequent absence of whānau relationships, and insufficient attention to whakapapa, hapū, iwi and regional difference. However, the authors argue that these findings do not cancel the learning design's educational value but rather confirm and help progress its evolution. That is, a resource which supports clinical reasoning but suffers from cultural inclusion incompleteness may still be revised rather than dismissed, evidenced by ākonga voice—especially the voices of those represented—as a normal quality improvement process.

Amy Benians and Katherine Danaher turn to knowledge formation in "Designing for Schema Development: Integrating Learning Theory and Neuroscience." Their starting question of how the schema concept can be useful in learning design is particularly timely: if learners increasingly use generative artificial intelligence (GenAI) to produce explanations and solve problems, what knowledge enables them to evaluate those outputs? The authors resist a simple pendulum swing

from constructivist learning back to memorisation and lectures. Instead, they argue, utilising schemata brings cognitivist and constructivist perspectives into the learning design conversation (Ertmer & Newby, 2013). Schemata organise knowledge and set expectations, but remain open to elaboration and revision. This supports practices such as activating prior knowledge, managing cognitive load, retrieval, spacing, experience, prediction, comparison, and reflection. Thus, foundational knowledge and critical thinking are not alternatives to each other but complementary skills in which critical judgement builds on sufficiently developed knowledge against which claims can be assessed.

PRACTITIONER JUDGEMENT AND TECHNOLOGICAL MEDIATION

Clare Morton's "The Dual Role of Facilitator and Learning Designer: Design Decisions and Blind Spots" turns attention to the practitioner. A facilitator who also designs for learning has valuable proximity to content, ākonga, and the teaching context, and can adjust pacing or representation in response to what occurs. However, Morton suggests, proximity can also conceal complexity, encourage excessive content, and allow intuition to stand in for evidence. Morton therefore argues for explicit design principles, transparent peer review, and organisational provision of time and professional support. Her practical workshop demonstrates how social constructivism, cognitive load theory, Universal Design for Learning, whanaungatanga, and ako may inform sequence, visual representation, shared activity, and reflection.

Sahar Chaer and Ghina Albadawi widen the context in "Designing AI-Supported Flipped Professional Development for Teachers." Developed in Lebanon during wartime disruption, their learning design model connects asynchronous preparation, synchronous learning interaction, and structured reflection. Digital platforms and GenAI-supported prompts serve differing functions within a deliberately sequenced framework. In this research, participants reported positive experiences of the asynchronous resources, live sessions, and flipped structure. However, since without baseline data or a comparable non-AI condition, the study cannot isolate GenAI's specific contribution; its significance lies instead in showing how technology may be intentionally bounded and placed within a coherent professional-learning design. This cautious interpretation of the authors is important where technological novelty can encourage claims that outrun available evidence (Miao & Holmes, 2023).

Jerrylynn Manuel closes the collection by asking, "Can Generative Artificial Intelligence Help Scale Instructional Coaching?" In her view, instructional coaching is relational and iterative, built on observation, personalised feedback, dialogue, and reflection. These qualities, she argues, help explain both its educational value and its cost. Manuel considers whether GenAI might provide automated feedback or support self-directed reflection, while remaining appropriately balanced. Although AI-generated feedback may be immediate and accessible, human feedback is more likely to be contextually grounded. Thus, the two may be valued for different purposes rather than functioning as substitutes (Henderson et al., 2025). GenAI might contribute to a differentiated support system, but human validation and professional judgement must remain available. Manuel concludes that scaling support is worthwhile only if efficiency does not remove the relationships and contextual understanding that made the support valuable.

CONCLUSION

Across the collection, learning design emerges as a practice of balancing: between new information and prior knowledge, culture and curriculum, planning and learner responsiveness, and digital resources and human relationships. To that extent, prior knowledge matters, but so does how that knowledge is recognised. Sequence matters, but so does responsiveness; reflection matters, but must be supported rather than merely requested. Technology may extend access and participation, but may also displace judgement or conceal new barriers; and perhaps most importantly, relationship building is not an add-on to the supposedly real work of cognition in learning but rather a core practice, which helps create the conditions in which learners take risks, offer interpretations, and revise their understanding.

Learning design is therefore not the production of perfect experiences. It is a methodological and relational practice of creating, examining, and revising the conditions offered to learners. It requires evidence interpreted in context, plans open to adaptation, and innovation answerable to educational and human purposes. We cannot ensure that learning happens. We can, however, influence what learners are invited to do, whose knowledge they encounter, and the resources, relationships, and forms of participation available to them. As these articles suggest, this is not merely a modest claim but an educational responsibility of the learning designer.

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TE AKO TĒTAHI KI TĒTAHI LEARNING FROM ONE ANOTHER: THE POWER OF AKO

Terri Brian and Jody Takimoana

Ko Poeura te Maunga (Poeura is my mountain)
Ko Waitangi te Awa (Waitangi is my river)
Ko Ngātokimatawhaorua te Waka (Ngātokimatawhaorua is my canoe)
Ko Oromāhoe te Marae (Oromāhoe is my Marae)
Ko Ngāti Kawa te Whare (Ngāti Kawa is my meeting house)
Ko Ngāpuhi te Iwi (Ngāpuhi is my tribe)
Ko Jody Takimoana tōku ingoa.

Ko Rangitoto te Maunga (Rangitoto is my mountain)
Ko Hauraki Gulf te Moana (Hauraki Gulf is my sea)
Nō te Motu o Waiheke o Tāmaki Makaurau te tūrangawaewae (Waiheke Island in Auckland is where I'm from)
Nō Whangārei ahau (I live in Whangārei).
Ko Brian, ko Wilson, ko Thomson, ko Adams, tōku iwi (Brian, Wilson, Thomson, Adams, are my family)
Ko Terri Brian tōku ingoa.

INTRODUCTION

References to te Tiriti o Waitangi (the Treaty of Waitangi) are common in education policy and strategy in Aotearoa New Zealand (for example, Education and Training Act, 2020; Ministry of Education, 2026; Tertiary Education Commission, 2025). The practical application of the treaty agreement in this context, however, requires thoughtful translation of high-level strategic commitments into everyday educational practices (Severinsen et al., 2025). Superficial implementation lacks meaning, and an approach is necessary that ensures the development of understanding, capacity, and capability (Came et al., 2020). This article seeks to acknowledge and support the responsibility to enact te Tiriti, by focusing on the intentional application of ako and whanaungatanga as examples of treaty partnership in tertiary education and, specifically, within learning design practice.

As co-authors of this article, we position ourselves as tangata whenua (Ngāpuhi) and tangata Tiriti (Pākehā). Our respective roles as Tumuaki Whakaako and Learning and Teaching Specialist within Te Ama Ako | Learning and Teaching Development at Otago Polytechnic reflect the collaborative and cross-cultural nature of our work. Central to our practice is the recognition of the foundational role of te Tiriti in facilitating partnership and establishing relationships where power is shared

while preserving distinct status and positions (Waitangi Tribunal, 2014). Our diverse backgrounds inform our approach, bringing together multiple perspectives while upholding our commitment to Tiriti obligations within our professional context. We recognise that our positions as academic and professional staff within Otago Polytechnic influence how we engage with this work, and we remain mindful of both the responsibilities and limitations that this entails.

Our methodology is grounded in critical pedagogy, which acknowledges power relations in educational settings and conceptualises education as a means for transformative action and change (Freire, 1970). We also draw on approaches that seek to challenge Western academic models and create space for indigenous knowledge systems and ways of being (Smith, 1995; Tawhai, 2020). In this article, ako is used to describe a te ao Māori epistemology in which learning and teaching are reciprocal and deeply interconnected (Berryman & Eley, 2017). This is distinguished from Ako (styled with an upper-case "A") as a pedagogical approach, which is positioned and discussed as forming a foundation for effective learning design in the tertiary education context.

The broader basis from which this article emerges is work by the Te Ama Ako | Learning and Teaching Development team to co-construct an understanding of ako and what it means for their practice. Beginning in 2021, under the guidance of former Tumuaki Whakaako, Ron Bull, a framework or "learning and teaching philosophy" was co-created to support the team's intentional application of ako in learning design and facilitation and, specifically, within Otago Polytechnic's newly designed Postgraduate Certificate in Learning Design. More recently, the authors have been evolving our own mahi in this space, and in November 2025 facilitated a workshop at the International Council for Open and Distance Education (ICDE) conference in Wellington. The kaupapa for this workshop supported the embedding of ako in online learning environments across a range of educational contexts. It focused on whanaungatanga and included and modelled ako in its design and delivery, allowing space for the sharing and co-creation of knowledge to occur. Much of the following text is transcribed from a recorded kōrero in which we begin by reflecting on our personal understandings of ako and whanaungatanga. We then consider how we see the tuākana-tēina relationship informing and shaping our roles and practice at Otago Polytechnic. Finally, we discuss how we think ako can be truly embedded in effective learning design, and how this might ultimately contribute to supporting Treaty partnerships and meaningful enactment of Te Tiriti o Waitangi. The conversational format is not intended to provide primary 'data' for autoethnographic analysis. It is based on our own opinions and understandings and, through our interactions, we see it as a way of modelling and enacting the concepts discussed in this article.

AKO

In a tertiary education context and building on the work of Dr Rangimarie Rose Pere (1994), ako has developed as a te ao Māori framing of learning and teaching, encompassing a variety of understandings and interpretations focused on the concept of reciprocity. Within this reciprocity, learning and teaching are shared and encouraged, and learners support, teach, and learn from one another (Macfarlane & Macfarlane, 2013). In this way, ako is distinguishable from Western expert, or transmission, models of education (Bishop et al., 2001), placing a strong focus on understanding learning from the ākonga perspective and adapting practice accordingly. Card et al. (2022) explain that ako defines the learning and teaching interaction while also describing the dual role of ākonga in the learning process. In this process, there is firstly the uptake of new knowledge (ako, in the role of learner) and secondly, the connection and integration of this knowledge with

existing cultural understandings and prior knowledge through self-reflection (ako, in the role of self-teacher). There is much discussion, however, as to what this means for pedagogy and praxis (Gillett-Swan, 2017).

TB: In your role as Tumuaki Whakaako, Jody, you play a key role in cultural leadership and advancing learning and teaching excellence that aligns with Māori aspirations, values, and worldviews. I'm interested to learn more about ako and how you understand it. How does it inform your approach to your role?

JT: From my perspective, there are a lot of nuances to ako. It's not just that kaiako are teaching or that ākonga are learning, but that at times those positions shift and change.

TB: Sometimes, maybe we have the idea that ako only relates to the knowledge or the content being taught at the time. We think, how can ākonga teach kaiako? How can that be ako? But can't kaiako also be learning other things from ākonga?

JT: Absolutely. It's all about the prior knowledge and experience that ākonga and kaiako bring with them to the learning experience. Sometimes ākonga are the experts. Kaiako might have a certain level of understanding of what they're teaching but ākonga might have a different background or perspective that they can add. That mātauranga, or that knowledge, needs to be utilised otherwise it's just not reflective of ako.

TB: So, we need to recognise the power dynamic that says, I'm the kaiako and you're the ākonga and I'm here to fill you up with my knowledge. We have to ask: how do I find out about ākonga and what they already know? How can I encourage them to share their knowledge and experience?

JT: Yes, and for that to happen and for a true representation of ako, there also should be a strong sense of whanaungatanga, because without that, ako isn't going to occur.

WHANAUNGATANGA

In practice, whanaungatanga is the nurturing of relationships, through care, connection, and common understandings and associations (Metge, 1990). These relationships can be based on things such as such as kinship ties, connections to places, interests, the environment, and shared learning experiences (Macfarlane et al., 2024). Bishop et al. (2013) explain that whanaungatanga in an educational context means that ākonga are treated as whānau, and this means creating learning experiences and interactions in which meaningful and reciprocal relationships can be built and sustained. Research clearly indicates that these kinds of relationships are integral to authentic learning for tangata whenua and tangata Tiriti alike (Alton-Lee, 2003; Macfarlane, 2004; Smith, 1995).

TB: Can you talk about how you understand whanaungatanga? What is its connection to ako?

JT: The direct translation of "whanaungatanga" is "relationship," but within ako it's about how that relationship is enacted. If there's a strong sense of whanaungatanga and connection, then the reciprocation of learning and teaching becomes much more fluid and valuable. Without whanaungatanga, kaiako have all the knowledge and power to impart and learning becomes more of a transactional experience. It can be very one-way. But also, if ākonga don't have a relationship with kaiako, then the knowledge can be lost, or the learning doesn't have the value that it should. Building whanaungatanga takes time, though, and needs the space to happen. We can't just expect it to be there straight away.

TB: So, how do we build whanaungatanga?

JT: For me, whether it's in a learning environment, my whānau, the community, or wherever, I'm building relationships. If you don't have good relationships in those spaces, it's very hard to move forward. In my role here at Otago Polytechnic, I work with various teams and at all levels. The key to my role is whanaungatanga. If I don't have those relationships, then the mahi doesn't move, it just stays the way it's always been, so I see whanaungatanga as being critical to that.

TB: When I think about whanaungatanga, I think about a sense of belonging, having shared goals, or finding things in common with other people.

JT: For whanaungatanga to really work, there needs to be a connection. When someone does their mihi, in a Māori sense, they're saying this is how I'm connected to where I'm from, my whakapapa, the whenua, the moana. It creates those common threads. Whanaungatanga is about finding those threads. Not just individually, but how you're connected collectively.

While whanaungatanga is central to the design of Ako-based learning experiences, there should not be an expectation that it is taught directly as a concept, philosophy, or practice. The goal is to create learning environments in which everyone experiences whanaungatanga and where ākonga feel welcome, respected, and supported (Harris et al., 2025). This requires the embedding of opportunities for kaiako and ākonga to meet, connect, and share information about who they are and where they are from. Supporting authenticity and modelling power-sharing in this way demonstrates willingness to learn with, from, and about each other (Macfarlane et al., 2024). Building whanaungatanga in a learning environment requires purposefully including spaces in which risk taking is encouraged, where there is no shame in "not knowing" and where it is understood that everyone brings with them knowledge and experiences of value to share. Ako-based learning design therefore requires making space for whanaungatanga and creating opportunities for the sharing of knowledge. According to Berryman et al. (2018), these pedagogies emerge from within a relational dialogic space; however, to engage in that dialogue, we must first respect diversity and understand the potential for learning and growth through the exploration of differences.

TB: How do you see ako and whanaungatanga influencing your role as Tumuaki Whakaako at Otago Polytechnic?

JT: A good question this one. If you look at my job description, it's very structured, but really, my role is entrenched in whanaungatanga and the building of relationships. As an example, when we designed the workshop for the ICDE conference, if you and I didn't have a relationship, didn't have whanaungatanga, and we'd just come together without a shared understanding, the whole experience would have been so different. I don't think we would have come to the same place with that mahi, if we hadn't been engaged in whanaungatanga on a regular basis. We know each other and what we're trying to achieve, and we can talk to that. But we can also disagree with each other as well, and that's an important part. There's always going to be sticking points and contention, and that's sometimes necessary for growth. Ako and whanaungatanga provide a safe connected space to work things out together and achieve a shared understanding.

This approach aligns with the notion of partnership that has emerged from contemporary interpretations of Te Tiriti o Waitangi (Bishop, 2003; Hudson & Russell, 2009). Macfarlane et al. (2024) for example, propose the metaphor of he awa whiria (a braided stream) as an appropriate description of the ways in which the Western and te ao Māori understandings can converge, diverge, and run together in alliance towards the same destination, linking cultural perspectives.

TB: We weren't intentionally teaching each other anything, but we were using our sense of a common goal to get to a place where we were both happy with the outcome. It wasn't a traditional, transactional exchange of knowledge, where one person passes knowledge to another. We were both equal participants, but we had different perspectives and areas of understanding and expertise that we brought together to create something new.

JT: In our mahi, we reflected on a whole lot of different areas and talked about it, and as a result some new knowledge has come out of that. Creating new knowledge and understanding is central to ako. But it doesn't have to be directive, and it doesn't always have to be one, or the same, more knowledgeable or experienced person making all the decisions.

THE TUĀKANA-TĒINA RELATIONSHIP

According to Winitana (2012), there are a number of possibilities within a tertiary education context for those more knowledgeable and experienced to model and mentor skills and behaviours for those inexperienced and less knowledgeable. Winitana suggests that one such possibility is what she refers to as the "tuakana–teina pedagogy" which draws on traditional Māori cultural practices where the tuakana is an older, more experienced sibling and the teina is a younger sibling, or novice. Within ako, the role of the tuakana is to guide learning, validate prior knowledge and experience, and maintain a balance of power within the learning relationship. The role of the teina is to learn through experimentation, creative thinking, and self-reflection (Ministry of Education, 2009). It is important to note, however, that these roles are dynamic and interchangeable at any time. Pedagogically, in a tertiary education context, the tuākana-tēina relationship can be interpreted as the learning and teaching interaction between kaiako (tuākana), and ākonga (tēina). It can also exist between ākonga as they interact and collaborate in pair or group learning experiences (Raumati Hook et al., 2007). From a Māori worldview, the tuakana holds the mana of their field of expertise; however, uplifting the mana of both tuakana and teina, is central to the tuākana-tēina pedagogy. This involves creating safe learning environments and learning experiences informed by ako and grounded in trust-based relationships (Winitana, 2012).

TB: To what extent do you see our approach to our mahi reflective of a tuakana-teina relationship or pedagogy?

JT: If we're talking about the embedding of te ao Māori perspectives, I would be, I suppose, the tuakana, but from a learning design perspective, I might be more teina. If I step into more of a leadership role, then I'm Tumuaki Whakaako in that space. To say you're always the tuakana, that's not realistic. It depends on the environment. But it shifts and changes so much, so quickly. It's important to recognise that we're all shifting and changing from being tuākana to tēina and back depending on what we're doing and where we are at the time. I think the beauty of ako, and whanaungatanga is that they help can create and support that dynamic.

TB: When I first started working with you on the PGCLD programme, and I was looking for answers about how to embed ako, I thought, I'll just have a meeting with Jody—he'll tell me what to do. But instead of explicitly teaching me how do it, the way you've purposefully modelled whanaungatanga and ako has helped me develop a deeper understanding. I think that was also reflected in the way we designed the ICDE workshop. I try to use this modelling approach with ākonga, so they can develop their own understanding. It can sometimes be uncomfortable as kaiako, though, because an ako-based approach is different from more traditional Western models of learning and teaching, and ākonga can get frustrated if they're expecting us to just tell them how to do it.

JT: I think the learning is actually in the process of doing it and being a part of it as well. Although some learning experiences do have to be very pragmatic; especially in vocational education, you can still weave concepts like ako, whanaungatanga, and tuākana-tēina through your design and facilitation.

AKO-BASED LEARNING DESIGN

Drawing on the idea that it incorporates the processes of both learning and teaching through dialogic practice, Ako-based pedagogies are aligned with socio-constructivist views and strategies that draw on kaiako-ākonga partnerships. According to Pere (1994), ako situates ākonga together at the centre of any learning and teaching activity. Hemara (2000) notes that it is important to distinguish this from Western educational models that place ākonga in the centre but alone as individuals in the learning experience. Bishop and Glynn (2003) explain that an Ako-based pedagogy

centres ākonga by ensuring they are in control of the learning process and the construction of meaning. Bishop and Glynn emphasise that learning should therefore be designed to embrace diversity and leverage the richness of prior knowledge and experience to maximise benefit. Zepke and Leach (2005) suggest that reflection makes it possible for ākonga to learn from their experiences. Card et al. (2022) also highlight the importance of reflection within ako as a means of connecting and integrating new knowledge with existing understandings. Additionally, reflection is fundamental to the modelling approach emphasised by ako (Hemara, 2000), highlighting the importance of creating opportunities for learning through demonstration, and for providing clear, effective, and ongoing, assessment and feedback (Bishop and Glynn, 2003).

TB: So, my understanding as a learning designer is that applying an Ako-based approach means firstly providing space for building whanaungatanga, whether that's in an online or kanohi ki te kanohi (face-to-face) learning environment. Without whanaungatanga, there can't really be an authentic exchange of ideas or co-construction of knowledge. Ako then needs to be supported by structured learning activities that include opportunities for reflection, two-way feedback, and regular evaluation of progress toward a shared learning goal. We need to create learning experiences that value the prior experience and ways of knowing that ākonga bring with them. And, by drawing on a tuākana-tēina pedagogy, we can acknowledge and leverage the idea that we are all learners and teachers at different times, and in different contexts throughout our lives.

JT: I always try to apply the concepts we've been talking about in my practice. That ako process: you have something that I can learn from you, I have something that you can learn from me. Fundamentally, I believe it's about upholding the mana of Te Tiriti o Waitangi, and I think all these ideas and ways of knowing and being are connected to us being true partners. I want us to just keep moving the dial on this mahi. It's important that things keep happening like what we're doing here. It takes work for different ways of knowing and being to become the norm, and to me, ako and whanaungatanga are a big piece of enacting the tangata Māori-tangata Tiriti partnership.

CONCLUSION

Ako embodies the idea that we are all learners and teachers and are empowered to learn with and from each other. Within this reciprocal relationship, we are not expected to know everything, and each brings knowledge and experience from which we are all able to learn. Embedding and modelling ako means recognising and valuing ākonga diversity, while encouraging connection and validating existing knowledge and experience. Meaningful embedding of ako in the learning experiences and interactions we design and facilitate requires a commitment to understand ako on more than just a surface level. It demands the intentional and consistent enactment of te Tiriti partnerships and the application of pedagogies that acknowledge te ao Māori epistemologies. It involves examining existing paradigms of learning and teaching and facilitating relationships that support open and authentic dialogue. In this way, we can continue to grow our shared understanding and create new knowledge within our specific contexts.

The increasing diversity of learner cohorts amplifies the need to provide a range of options to support engagement and learning success. Learning designers must therefore advocate for and purposefully create spaces in all learning environments in which whanaungatanga and ako can authentically occur. The design of purposeful and effective Ako-based learning activities should acknowledge and leverage the prior knowledge and experience of ākonga, and involve elements of discussion, collaboration, and reflection. To enable authentic and productive te Tiriti partnerships, power imbalances also need to be acknowledged and addressed within the design of learning experiences. Failure to do so can produce inequities and significantly limit knowledge sharing and open dialogue, potentially limiting the transformative potential of an Ako-based approach.

By utilising the dynamics of a tuākana-tēina pedagogy, learning designers can help address the power imbalances inherent in traditional learning and teaching paradigms and encourage ākonga and kaiako to learn from themselves, and one another.

We are well placed in Aotearoa New Zealand to create culturally responsive tertiary education environments that respect diverse ways of learning and knowing. By purposefully seeking to develop our understanding of these different approaches, we can continue to connect with and learn from each other and ourselves. Ensuring ako and whanaungatanga are at the heart of what we do enables us to create and inclusive and equitable learning and teaching experiences. This in turn, supports us to work alongside each other, and to participate in, and create, learning and teaching environments as authentic Tiriti partners.

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SUPPORTING INTERNATIONAL TERTIARY STUDENTS IN AOTEAROA NEW ZEALAND THROUGH BUILDING RELATIONSHIPS AND FOSTERING BELONGING

Rachael S. Burke

INTRODUCTION

Learning design has emerged as a distinct professional practice within tertiary education, concerned with the intentional planning of learning environments, experiences, and interactions that support diverse learners (Bennett et al., 2017; Goodyear, 2015). With rising numbers of families from diverse cultural backgrounds settling in Aotearoa New Zealand, the country is now described as "super-diverse" and faces emerging challenges due to heightened cultural complexity (Chan, 2019). International students, or those from migrant backgrounds, may find it difficult to navigate the social, cultural, and academic environment of Aotearoa New Zealand (Coburn, 2020).

This reflection explores not only teaching and learning strategies but also the intentional learning design decisions that help build strong reciprocal relationships and develop students' sense of belonging in culturally diverse classrooms at one tertiary institute. It draws on the Māori model of wellbeing, Te Whare Tapa Whā (Durie, 1994), to inform the design of learning experiences through positioning whanaungatanga (relationship building) and manaakitanga (care and hospitality) as relational learning principles. Māori are the indigenous people of Aotearoa New Zealand, and their rights are upheld under Te Tiriti o Waitangi. This reflection argues that whanaungatanga and manaakitanga function as both cultural values and learning design principles that intentionally shape curriculum architecture, learner interaction, and assessment experiences, particularly for international cohorts. These principles influence student experiences of belonging, wellbeing, and academic success. This reflection also draws on slow pedagogy (Clark, 2023), which emphasises giving students the time and space to engage deeply alongside tuakana-teina (Mead, 2016), a reciprocal learning relationship in which the older sibling (tuakana) guides the younger (teina).

As the author of this reflection, I write from my position as a Pākehā/tangata Tiriti lecturer and researcher working in initial teacher education. My teaching practice has involved supporting culturally diverse and international student cohorts. My understanding has been shaped through ongoing professional learning, collaboration with Māori colleagues, and guidance from kaupapa Māori advisers. This reflection therefore represents my experiences of attempting to enact te Tiriti-led, relationship-centred approaches within my practice. This reflective account of professional practice is informed by Goodyear's (2015) conception of teaching as design, which positions educators as active designers of learning environments, interactions, and experiences.

Through this lens, I examine how the principles of whanaungatanga and manaakitanga have shaped intentional decisions about classroom culture, learner engagement, and wellbeing initiatives for international students.

FRAMING THE AOTEAROA NEW ZEALAND EDUCATIONAL CONTEXT

All interactions in the Aotearoa New Zealand context are framed by Te Tiriti o Waitangi, the nation's founding document signed in 1840 between representatives of Māori and the Crown. This agreement established the foundation for Māori and Pākehā (European New Zealanders) to live together as citizens of Aotearoa New Zealand, based on principles of partnership, participation, and protection.

As government funded agencies, New Zealand tertiary institutes must address specific treaty rights and responsibilities (Pio et al., 2014). The Education Training Act (2020) articulates a commitment to culturally responsive, inclusive education from early learning through to tertiary education. Teachers in Aotearoa New Zealand also need to understand te Tiriti and how it applies to educational contexts (Education Council, 2017). Competency in te reo Māori (the Māori language) is also a graduation requirement for teachers in Aotearoa New Zealand, further reflecting the commitment to bicultural practice. O'Toole et al. (2019) define a Tiriti-led approach as one that honours Māori as tangata whenua (people of the land) and recognises culture and language as essential to Māori identity and wellbeing. Māori values such as whanaungatanga and manaakitanga, embodied in frameworks such as Te Whare Tapa Whā (Durie, 1994), are complementary to social and emotional learning and are explored further below.

A central idea in te Tiriti is the concept of tūrangawaewae (a place to stand) which affirms the right of all peoples to belong, as equals. With Aotearoa New Zealand's growing diversity, this principle has come to include all tangata (people) who call this land home (Webber et al., 2023). A Tiriti-led approach is one that acknowledges Māori as tangata whenua and draws on whanaungatanga and manaakitanga.

WHANAUNGATANGA AND MANAAKITANGA

Mead (2016) describes whanaungatanga as the process of developing respectful, reciprocal relationships, including caring for others and collective wellbeing. While originating from kinship and familial relationships, whanaungatanga extends beyond family ties to include collective relationships within educational and community settings. Closely connected to whanaungatanga is manaakitanga which Mead (2016) characterises as the process of showing respect for, and generosity, care, and hospitality to, others. Together, these values provide a relational foundation for teaching and learning (Ministry of Education, 2023). From a learning design perspective, whanaungatanga and manaakitanga function as relational design principles that guide how learning environments, communication protocols, and collaborative activities foster belonging and wellbeing (Goodyear, 2015). These principles underscore the importance of teachers and students getting to know each other and building a culture of trust and care in the classroom. Throughout this reflection, the examples presented are examined from the interconnected perspectives of whanaungatanga and manaakitanga, demonstrating how relationship-building and acts of care can be intentionally designed into tertiary learning environments for international students.

Whanaungatanga and manaakitanga in practice

Institutional systems supporting diversity are important, but ultimately, what matters most is how students feel in their environment. This begins with simple gestures, such as learning and using students' correct names and pronouns. Doing so affirms their identities and fosters a sense of belonging in the classroom (Spade, 2011). Early in my teaching of culturally diverse classes, I discovered that names were more complex than I had anticipated. A student might use a name from their passport, the name listed on the institute's student management system, a simplified version in their home language, or an English name adopted after arrival. Practicum placements sometimes highlighted issues when visiting lecturers could not locate students due to discrepancies in names. At other times students would not respond or be confused when their peers or teachers used unfamiliar versions of their names.

As an intentional learning design strategy, a name game was introduced at the beginning of the course to create the conditions for whanaungatanga and to establish relational trust and identity safety. For this game, students sit in a circle and choose an adjective that begins with the same letter as their name; for example, Radiant Rachael, paired with an action, such as mimicking the sun rising for "radiant." Pronouns can also be included. The second person repeats the first name with the adjective and action and then adds their own, continuing around the circle. Positioned at the beginning of the course, this activity forms part of a designed pathway to belonging, supporting learning outcomes related to collaboration and culturally responsive practice (Biggs et al., 2022). This playful activity allows students to share preferred names and pronouns, fosters connection from day one, and creates a supportive space for pronunciation correction. This activity promotes whanaungatanga by helping students establish meaningful connections with one another, while manaakitanga is demonstrated through the respectful acknowledgement of preferred names, identities, and pronouns.

This kind of relational engagement continues throughout the course. For example, students might be invited to bring a meaningful object from home to share its cultural or personal significance (Sammons et al., 2020). Whanaungatanga and manaakitanga are integral to every class. This relationship-building may take the form of group games or activities, sharing kōrero (conversations), moving outside the classroom, or sharing kai (food) together. Such activities can be linked to course content or serve as stand-alone community-building exercises.

In one activity, I asked: What brought you to this place in your life? Students were given 10 minutes to sketch key aspects of their life's journey, from the past towards the present, and into the future, considering family, professional and personal experiences. These life maps were then shared in small groups or as a class. It is through such sharing of stories and forging of connections that a community of learners is built. Reflective prompts included: How did you decide what was important to share about your life journey? How did it feel to share your story? What connections did you make with others? How might this relationship-building differ culturally from what you do in your own home country? These sessions often sparked deep emotional responses, cultivating empathy and mutual understanding among students from diverse countries and life experiences. The sharing of life stories strengthens whanaungatanga through the development of empathy and relational connection, while the respectful listening and valuing of diverse experiences reflects manaakitanga in action. These activities are not isolated teaching moments but are intentionally sequenced as part of a broader learning ecology design that scaffolds students' sense of belonging throughout the programme (Carvalho & Goodyear, 2014).

FOSTERING RELATIONSHIPS TO SUPPORT SUCCESS

Upholding whanaungatanga and manaakitanga also means actively fostering relationships that will help international students to be successful. I regularly invite learning facilitators, faculty librarians, health nurses, engagement facilitators, and international department staff into the classroom for focussed sessions. Kanohi ki te kanohi (face-to-face) interactions are prioritised, alongside class workshops on assessments and tasks, and the use of online forums to extend engagement. Introducing students to support staff in person demonstrates manaakitanga by ensuring students feel welcomed, supported, and cared for, while also strengthening whanaungatanga through the development of trusting relationships that extend beyond the classroom.

In blended and online contexts, the principles of whanaungatanga and manaakitanga inform the intentional design of digital learning spaces. Asynchronous discussion forums, structured peer-support activities, and multimodal communication channels are purposively designed to cultivate social presence and sustain connection beyond the physical classroom. These approaches align with Universal Design for Learning (UDL) which advocates for multiple means of engagement to support diverse learners (Hickey, 2021). Ample time is allocated for interactive activities that promote connection and understanding.

International students are given opportunities to have their voices heard at the departmental level and can feed back opinions about their classes. Each class elects at least one class representative, although this role is often shared among students, to ensure regular communication and feedback. Institute-wide surveys, distributed via the online student management system, further encourage students to reflect on and evaluate their learning experiences. At the end of every semester, students are invited to provide anonymous feedback on my course and my teaching. Time is set aside in class for this purpose. In turn, I provide comprehensive, personalised feedback on their assessments, highlighting areas of achievement in relation to learning outcomes, as well as areas for growth.

DRAWING ON SLOW PEDAGOGY AND TUAKANA-TEINA APPROACHES

Slow pedagogy, as expressed by Clark (2023), emphasises giving students the time, space, and freedom to think, reflect, and engage deeply with their learning. This approach is particularly relevant for international students, who may need more time to process feedback due to language differences, cultural expectations, or unfamiliarity with academic standards. The values of slow pedagogy, such as care, presence, and trust, align with whanaungatanga and manaakitanga. When given thoughtfully and with aroha (love), feedback becomes an extension of a trusting, respectful relationships where students feel safe to make mistakes and grow. Student evaluations of my teaching indicate that slow, intentional practice fosters a strong sense of connection and academic growth.

I also draw on the Māori practice of tuakana-teina by bringing different cohorts together to foster peer learning and support. Tuakana-teina refers to the relationship between an older sibling (tuakana) and a younger sibling (teina). This dynamic encourages reciprocal learning: the older teaches the younger, and the younger reminds the older of patience and tolerance (Mead, 2016). For example, when weaving putitputi (flowers) from harakeke (flax), the more experienced students support beginners which models tuakana-teina in action. These types of shared group activities also help students to understand and embody matauranga Māori (Māori knowledge).

MĀORI MODELS OF WELLBEING

Māori understandings of wellbeing incorporate the principles of whanaungatanga and manaakitanga, recognising that wellbeing is nurtured through relationships, community connections, care, and support. One model that aligns well with this discussion is Te Whare Tapa Whā (Durie, 1994) which provides a holistic framework for understanding wellbeing and fostering a sense of belonging. Rather than viewing wellbeing as an individual responsibility, the model emphasises the interconnected nature of physical, emotional, spiritual and relational dimensions of health.

Te Whare Tapa Whā

Te Whare Tapa Whā, developed by Durie (1994) in consultation with Māori communities, presents a model of health as a wharenui (meeting house) with four walls (tapa whā), each representing a cornerstone of holistic health: tinana (physical health), wairua (spiritual health), whānau (family health), and hinengaro (mental health). While Western health models often acknowledge physical, mental, and social aspects, they frequently overlook the spiritual dimension which is central to Māori understandings of wellbeing (Durie, 1994). Rather than a biomedical approach to health, Te Whare Tapa Whā takes a holistic view of hauora (health) that recognises the interconnected influence of relationships, culture, environment, and personal wellbeing. The use of Te Whare Tapa Whā complements whanaungatanga and manaakitanga by recognising that individual wellbeing is shaped through relationships with others. Reflecting on personal support networks, emotional wellbeing, spiritual practices, and physical health encourages students to strengthen connections with themselves and others, while creating opportunities for teachers to respond with care and support.

Te Whare Tapa Whā in practice

Drawing on the help and advice of specialist kaupapa Māori advisors working at the tertiary institute where teaching took place, activities were designed to support students to explore the dimensions of Te Whare Tapa Whā. Firstly, they were asked to reflect on the four walls:

- Taha whānau – Who are the people, whānau (family), or friends who form your inner circle of support?
- Taha hinengaro – What helps you clear your mind? Perhaps talking to someone, or staying organised to avoid feeling overwhelmed?
- Taha wairua – What practices (if any) do you use for self-care? This might include spending time with children or friends, writing in a journal, yoga, using crystals, or saying karakia (prayer).
- Taha tinana – How do you care for your physical health? For example, by maintaining a good sleep routine, limiting social media use, exercising regularly, or eating nourishing food.

Students were then given time to create their own Te Whare Tapa Whā using a template that included the outline of a house and the grounding of the earth. They were encouraged to write or draw their thoughts next to each taha, considering their personal experience of hauora. As this was a reflective and individual activity, students were not required to share their work with the class. However, a follow-up activity was designed to build relationships and foster open communication around wellbeing. The design of these reflective and collaborative activities demonstrates how Te Whare Tapa Whā can guide curriculum architecture and assessment design, ensuring that learning experiences attend to students' physical, emotional, spiritual, and social dimensions (Carvalho & Goodyear, 2014).

Creating a whare as a group

According to Durie's (1994) model, all sides of the whare need to be strong and balance each other in order to achieve and maintain health. The follow-up activity involved preparing resources such as ice-block sticks, string, felt, and cardboard and dividing these among groups of students. Alternatively, the students could be asked to gather natural resources (such as leaves, sticks, or bark) to use for this activity. Each group was asked to use the materials provided to make their own Te Whare Tapa Whā. This activity not only supported their development in working collaboratively, a vital skill for professional ECE teachers, but also highlighted the significance of each of the four walls being equally strong if their whare collapsed, reinforcing the concept of holistic well-being.

Noho marae

An experience that may be relatively unique to the New Zealand educational context is the noho marae, which refers to staying overnight at a traditional Māori gathering place. Noho marae can last for several days but, in the case of this programme, students and teachers stay together for one night and two days. This embodied cultural experience supports groups to learn more about Māori culture in an authentic way. While noho marae naturally strengthens whanaungatanga through shared experiences and collective participation, it also provides powerful examples of manaakitanga. Through the hospitality, care and cultural guidance provided by marae hosts, students experience firsthand how relationships are nurtured and mana is upheld within Māori communities (Mead, 2016).

Sammons et al. (2020) argues that sharing artefacts can deepen cultural understandings within diverse groups. I used this approach again during noho marae, where students were invited to bring an item of cultural significance to them. Each student took a turn presenting their object and sharing its personal and cultural meaning. This process revealed many powerful stories of resilience, love, family, and childhood. The strong sense of belonging that developed among the group reflected their collective willingness to listen, remain open-minded, and learn about one another's cultures (Tomsett et al., 2023).

EMERGING EVIDENCE OF EFFECTIVENESS

Student feedback suggests that practices grounded in whanaungatanga and manaakitanga contributed to a learning environment characterised by trust, care, inclusion, and belonging. Comments describing the learning environment as "supportive", "inclusive," and "full of love and trust" indicate that students experience both relational connection and care which appeared to support confidence, engagement, and willingness to seek assistance from support services.

Observations during class activities and noho marae further suggested deeper peer connection, greater openness, and improved participation among students who initially appeared withdrawn or hesitant. While the evidence is reflective rather than formally measured, these patterns indicate that culturally grounded, relationship-first pedagogy can meaningfully strengthen international students' sense of belonging and readiness to learn.

IMPLICATIONS FOR OTHER INTERNATIONAL CONTEXTS

Although rooted in the Aotearoa New Zealand context, many aspects of this approach are transferable to international higher education settings seeking to improve belonging and wellbeing among diverse student cohorts. The core principles of whanaungatanga and manaakitanga as expressed through holistic wellbeing models such as Te Whare Tapa Whā (Durie, 1994) can be adapted as universal design elements rather than culturally bounded practices. For example, name-learning rituals, sharing personal artefacts, life-mapping, and incorporating peer-mentoring dynamics (similar to tuakana-teina) can be implemented in culturally diverse classrooms anywhere, and be adapted to various indigenous frameworks.

These practices align with global literature emphasising social connectedness, culturally responsive pedagogy, and the role of teacher-student relationships in fostering belonging among international students (Bi, 2025; Heddy & McCotter, 2025). In online environments, these principles might be enacted through intentionally designed discussion forums, peer-mentoring structures, welcoming video introductions, regular personalised feedback, collaborative group tasks, and opportunities for students to share aspects of their cultural identities. Such approaches can help establish social presence and belonging even when learners are geographically dispersed. By intentionally foregrounding relationality, emotional safety, and community-building, tertiary educators worldwide can create learning environments where students from any cultural background can feel seen, supported, and valued.

CONCLUSION

Supporting international students in Aotearoa New Zealand requires more than institutional policies and academic support structures; it requires intentional, relationship-centred practice. This reflection has explored how the Māori values of whanaungatanga and manaakitanga can serve as guiding principles for designing learning environments that foster belonging, trust, and care for international students. Through intentionally designed opportunities for relationship-building, sharing personal narratives, connecting with support services, and participating in culturally grounded experiences such as noho marae, students are supported to develop meaningful connections with both peers and teachers.

Te Whare Tapa Whā provides a useful framework for understanding wellbeing as holistic and relational, recognising the interconnected dimensions of physical, emotional, spiritual, and social health. Activities informed by this model encouraged students to reflect on their own wellbeing while strengthening relationships and communication. While this reflection is situated within the Aotearoa New Zealand context, the underlying principles of relationship-building have wider relevance for tertiary education internationally. By viewing whanaungatanga and manaakitanga as learning design principles rather than solely cultural concepts, teachers can intentionally create inclusive learning environments in which diverse learners feel seen, valued, and supported to succeed.

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STUDENTS' PERSPECTIVES ON A BICULTURAL VIRTUAL WHĀNAU: ADVANCING TE TIRITI O WAITANGI IN NURSING CURRICULA

Roseanne Sadd, Colleen Reilly, Shirley Lyford and Te Aniwa Wakem

INTRODUCTION AND BACKGROUND

In 2024, the regulatory body for nursing and nursing education programmes, Te Kaunihera Tapuhi o Aotearoa Nursing Council of New Zealand (NCNZ), updated the Nursing Education Standards and in 2025 released an updated Registered Nurse Scope of Practice with new Standards of Competence for Registered Nurses (NCNZ, 2025). Understanding Te Tiriti o Waitangi and implementing it in practice are embedded throughout the standards of competence. The current curriculum at Toi Ohomai Institute of Technology, Te Tohu Paetahi Tapuhi, Bachelor of Nursing (BN), will come under review in 2028; therefore, it is timely to examine teaching and learning strategies that help prepare ākonga for safe, competent practice as registered nurses. The curriculum utilises a Te Tiriti o Waitangi perspective by imbuing Te Wheke with He Korowai Hihimā. Te Wheke is the holistic assessment framework which has been the Pou of the nursing curriculum since the first delivery of the Comprehensive Diploma of Nursing at the legacy institution Waiareki in 1986 (Pere, 1984; Riini & Lyford, 2022). He Korowai Hihimā refers to the metaphor of raranga (weaving) each ākonga tapuhi undergoes during their educative journey towards attainment of the BN. Together, they enact the bicultural commitment to meeting the needs of two distinct groups within Aotearoa New Zealand: Māori as tangata whenua and all others as tangata tiriti (Riini & Lyford, 2022; Toi Ohomai Institute of Technology, 2025).

In 2016, through the-then Waiariki Institute of Technology, an innovation award was granted to develop a "virtual whānau" of avatars that reflect the demographics of the Toi Ohomai rohe for nursing simulations. In our context, virtual whānau refers to whānau or family groups made up of members who are not real. While they have virtual representation in terms of a static avatar, there is no assumption that ākonga interact with them solely through digital means. Virtual whānau member avatars help create realism, as actors in nursing clinical laboratory in-person simulation role-plays are provided with visual cues such as clothing and accessories consistent with the virtual whānau member and which provide continuity with the virtual appearance of the avatar.

The two initial whānau, each consisting of three generations, conceptualise the bicultural relationship, aiming to foster connection with and holistic understanding of patients (Sadd & Marsh, 2024). Connections are made with the wider BN virtual whānau through relationships

between individual whānau members. Virtual whānau members experience a variety of health issues and are given fictitious names, with care taken not to use any locally related or identifiable names. In 2018, a concern was identified with the naming of Māori whānau. The significance of names within te ao Māori was acknowledged, and there was reluctance to use names that might be family names of ākonga or names from other iwi, hapū, or tribes. Therefore, in consultation with a local kuia, a positive alternative was found by using the names of native trees for whānau surnames (Sadd & Marsh, 2024). This approach minimises the risk of offending anyone and encompasses the Māori value of connection to our natural surroundings.

Whānau members are used across all years of the curriculum, with their presenting problems increasing in complexity as ākonga progress through each year and in relation to the learning outcomes for each course. Each family whānau member has a primary diagnosis that aligns with a simulation scenario. A medical history is developed to support this and may unfold over subsequent years as ākonga progress through the degree. A fuller holistic profile is developed using a Te Wheke assessment framework embedded within the degree (Pere, 1984; Riini & Lyford, 2022). In recent years, use of virtual whānau members has been extended within non-clinical theory courses for lifespan development, case studies, presentation scenarios, and examinations, increasing the realism of applied theory.

While kaiako report positive ākonga engagement, the virtual whānau as a teaching and learning strategy has not been formally evaluated. This lack of evaluation highlights the need to explore ākonga perspectives, particularly those of ākonga Māori, to understand the efficacy of this resource and to ensure its cultural appropriateness.

VIRTUAL FAMILY AND COMMUNITIES IN NURSING LITERATURE

Literature regarding virtual patients predominately refers to virtual patients or families as a purely digital or online resource, whereby ākonga engage through animated case studies or virtual simulations. Virtual patients are a recent addition to nursing pedagogy aimed at developing non-technical skills in undergraduate health professionals (Peddle et al., 2019), commonly presented as clinical cases for ākonga to work through and more recently associated with virtual simulation,

Shahtahmasebi and Liddell (2011) described the development and use of a virtual family to simulate different stages throughout the lifespan including the creation and developmental process of their family and its use within a single nursing course. Within a problem-based learning nursing curriculum, Sharp and Primrose (2003) found that having a longitudinal approach over a four-year curriculum enabled ākonga to recognise the long-term effects of healthcare. Positive outcomes relating to knowledge acquisition and clinical reasoning have been reported when using virtual patients or families when compared to traditional non-virtual health profession education (Kononowicz et al., 2019). Padilha et al. (2024) evaluated the integration of virtual patients into their nursing degree, reporting a positive effect on ākonga decision making. However, this study, as with most of the literature examined, used virtual patients in a simulated online environment only.

The integration of an intergenerational virtual family used in Sezer and Sezer (2019) most closely aligns to the virtual whānau integration in our curriculum, although this research was interested in the design and development of a virtual family. Having an intergenerational and multicultural virtual family was reported by Waters (2014) as increasing cultural awareness in nursing ākonga. Similarly to the BN virtual whānau, Levett-Jones et al.'s (2015) Wiimali virtual community and

Wright et al.'s (2021), interprofessional virtual community reflect the local communities and residents, prompting ākonga insights on the impact of community resources and culture on health.

RESEARCH QUESTIONS

The aim of this research is to increase our understanding of how Bachelor of Nursing (BN) ākonga perceive and experience a BN virtual whānau, and how virtual whānau support ākonga learning and preparation for practice. This study seeks to answer the following research questions:

- In what ways does the BN virtual whānau support ākonga to integrate theory into clinical practice?
- How well does a bicultural virtual whānau incorporate Te Tiriti o Waitangi and culturally safe practice into the BN curriculum?
- Do ākonga Māori perceive that Māori virtual whānau members reflect te ao Māori?

RESEARCH METHODS AND DESIGN

This study utilised a sequential exploratory mixed method design where qualitative focus group data was collected and analysed to inform the quantitative data collected using an online survey (Creswell & Plano Clark, 2017). The initial qualitative phase allowed for in-depth exploration of ākonga experiences with the virtual whānau which was then validated for generalisation by quantitative data analysis (Creswell & Plano Clark, 2017).

Current year 2 and year 3 ākonga enrolled in the Bachelor of Nursing degree were invited to participate in focus groups (N = 237). A total of four focus groups were held (two on each campus site (n = 21). A further two focus groups were held at each campus for ākonga Māori (n = 9) in relation to research question three.

Data from focus groups was analysed using conventional content analysis, which is suitable to explore and describe experiences within complex situations encountered within nursing and healthcare (Hsieh & Shannon, 2005; Vaismoradi et al., 2013). Themes were confirmed and corroborated based on steps followed by Vaismoradi et al. (2013). This was undertaken concurrently by researchers, separately and together. This process was repeated for ākonga Māori focus groups, facilitated by the kaiako Māori researcher.

Emerging themes were used to develop confirmatory survey items and gain further insights. Content and face validation of the survey questions was confirmed by subject matter experts and a survey pilot. An invitation to participate in the survey was extended to year 1 BN ākonga in addition to the year 2 and 3 ākonga. A total of 79 ākonga completed the online survey (Table 1).

Data was analysed using IBM Statistical Package for Social Sciences (SPSS), Version 31. Demographic data, multiple response items, and preference items (more/same/less) were examined using descriptive statistics to summarise participant characteristics and responses. Likert-scale items were coded on a four-point scale (1 = not at all to 4 = a lot) and screened for missing values prior to analysis. Conceptually related items were grouped into four composite scales: Q.5 cultural and professional learning, Q.9 knowledge understanding, Q.10 application, and Q.11 clinical preparedness. Internal consistency and reliability of each scale were validated with an

		N	%
Age	18–24	26	32.9%
	25+	52	65.8%
	Unknown / not declared	1	1.3%
Ethnicity	Tangata whenua / Māori	21	26.6%
	Tangata tiriti / Non-Māori English first language (EFL)	29	36.7%
	Tangata tiriti / Non-Māori English as speakers of other languages (ESOL)	20	25.3%
	Unknown / not stated	9	11.4%
Year of Study (BN)	Year 1	30	38.0%
	Year 2	27	34.2%
	Year 3	22	27.8%

Table 1. Demographic characteristics of survey participants (N = 79).

overall Cronbach's alpha coefficient of .938 (Table 2). Given the ordinal nature of the data, non-parametric tests were used. Spearman's rank-order correlation examined relationships between composite scales and Kruskal–Wallis tests compared group differences. Areas of convergence are explored in the discussion section (Creswell & Plano Clark, 2017).

Scale	Cronbach's alpha	N. of items
Cultural & Professional concepts (Q.5)	.906	4
Knowledge understanding (Q.9)	.886	6
Application	.901	6
Clinical practice	.837	5
Combined scale items	.938	21

Table 2. Reliability statistics.

Ethical considerations

Ethics approval was gained from the institute's Research and Human Ethics Committee, approval number TRC 2025.007. The application process included review by a Kaihautu Rangahau (Māori research advisor). Ākonga Māori specific focus groups were facilitated by the kaiako Māori member of the research team.

FOCUS GROUP THEMES

Four themes were identified from the open focus groups (year 2 and 3 ākonga).

Bridging the gap – From simulation to clinical reality

The virtual whānau serve as a transitional mechanism, bridging the divide between theoretical knowledge and practical application in the clinical environment. "It's actually like a simulation scenario that will prepare you for the real world," one participant stated. Participants found that the virtual whānau assisted them in recognising and responding to clinical cues: "So I think it was

good as mental priming or conditioning to notice these kinds of things. Like ah, okay, I remember then the virtual whānau with this person in front of me."

The virtual whānau allow for experimentation without adverse consequence, which was consistently compared to fear surrounding the high-stakes clinical environment. "At least," one participant reported, "it prepares you in a learning environment where it's not like real life." The ability to practice communication and clinical skills in a controlled setting builds confidence. "I feel like I will never forget what I did," another ākonga said, "Yeah, so it did prepare me. Because in the end, we all have to work independently."

Cultivating cultural safety and holistic care

Cultivation of cultural safety was reported to be a significant strength of the virtual whānau. The virtual whānau facilitates an understanding of patients within broader familial and cultural contexts and the need for safe, holistic care. Participants frequently praised the inclusion of Māori virtual whānau and Māori health models. One ākonga, identifying as being tangata tiriti (ESOL), highlighted the virtual whānau's utility: "It gives ... a good idea or like a knowledge around how, for me as a person from a different culture, it really helped me to understand the culture better … how to keep the patient culturally safe." Participants called for enhanced diversity in the virtual whānau to better reflect the multicultural landscape of New Zealand: "I think because we are a country that is expanding, maybe so does our virtual whānau. I think that as well, like, with the LGBTQ+ community, like, kind of building on that more, because it is common to see that in practice."

Scaffolding professional identity and critical thinking

The virtual whānau play a pivotal role in the progressive development of a professional nursing identity. The continuity of the characters allows for a layered learning experience, where ākonga revisit familiar cases with increasing complexity:

> The virtual family grew with us as well. So from first year, we were only given a tiny snapshot of who they were and what they did. And then more got added into it as our complexities and our understanding grew. So did their background. So they grew with us.

The virtual whānau also encourages self-reflection and the development of a unique nursing philosophy for ākonga. One participant noted:

> it's taught me a lot about me and about how I am actually quite forward in what I do when it comes to patients and [I] needed to learn ... to like step back and … speak with the patient, you need to speak with them and be like, 'I'm going to do this, is that okay?'

The power of familiarity in reducing cognitive load

The consistent use of virtual whānau members throughout the nursing programme reduces cognitive load. The familiarity with whānau creates a sense of comfort and reduces anxiety, enabling ākonga to focus on applying clinical skills and critical thinking. "In a learning environment," one ākonga confirmed, "when you're learning something new, it's nice to have that familiarity already there. So, it's not, like, super, super overwhelming when you're learning something new." This comfort extends to emotional engagement, with ākonga often referring to the characters as if they were real individuals: "We walk into a lab and … they're like, oh, we're doing Lucy today. We're like, oh, yeah, how is she today? Is she sick? And we actually speak about her, like she's a person."

This emotional connection and familiarity aids in memory retention:

> Because as soon as you saw L [whānau member], I know L has COPD or asthma, like she's always got one of those two. So you know straight away what the situation is and it helps you, go back, oh yeah my understanding of that was this …

The consistent exposure to the evolving health narratives of whānau members supports ākonga to build frameworks and scaffold understanding. This makes the learning process more intuitive and less daunting.

ĀKONGA MĀORI PERCEPTIONS OF MĀORI VIRTUAL WHĀNAU

A further four themes were identified from ākonga Māori focus groups in relation to their perceptions of Māori whānau, representation of te ao Māori, and cultural appropriateness.

Authenticity versus stereotyping

Ākonga Māori highlighted tension between authentic representation and reliance on stereotypes. Some virtual whānau members were praised for having realistic backgrounds, others felt like a "real stereotype": "Because not all Māori are like that, my family, personally, we're not like that."

Marginalisation of tikanga in virtual whānau simulations

Participants highlighted a disconnect between the cultural focus of te ao Māori and the task-orientated clinical focus of simulations. Tikanga in the latter context is often marginalised or treated like an afterthought. "What I've noticed," one participant said, is that "the … te ao Māori part of … the person you're role-playing isn't really prominent in the script, like it's actually not in the script at all." The task-orientated nature of simulation labs can override opportunities to practice culturally safe care unless specifically identified in the session outcomes. Participants felt at times that tikanga was incorporated as a "box-ticking" exercise.

Absence of whānau and whanaungatanga

These essential tenets of te ao Māori were identified by ākonga Māori to be lacking. In clinical environments, Māori often have whānau members present, whereas virtual whānau typically present alone in simulations. "When I was in the hospital and we were surrounded by Māori patients, it was so much different and slower," one ākonga noticed, "the whanaungatanga part is, yeah... that's a big part of it compared to here [the lab]."

Matauranga Māori integration

A need for more profound and nuanced integration of mātauranga Māori into the virtual whānau profiles was highlighted. Virtual whānau members need detailed backgrounds that go beyond superficial traits: "A bit of, you know, whakapapa history would be good ... whānau, hapū, iwi ... because also with iwi, all [have] different dialects." Whakapapa, iwi, hapū, and dialect details need to be accurate for learning culturally safe care, with different regions having different customs and dialects. "It's about being culturally safe and approaching whānau," another participant said, "understanding [for example that] you're in Te Arawa region, so they do things different[ly]." Māori health models were preferred. Te Wheke, a Māori holistic model applied as an assessment framework throughout the programme (Riini & Lyford, 2022), was praised, as ākonga felt this provided deep understanding of the patient: "I really enjoy that framework [Te Wheke]. It pulls out a lot of knowledge from the case study...."

SURVEY RESULTS

Overall, ākonga reported high familiarity with the concept of virtual whānau and reported widespread exposure to its use across multiple teaching and learning contexts. Generally, ākonga had positive perceptions of how the virtual whānau contributed to learning and clinical application.

Nearly all respondents reported being able to identify virtual whānau groups (97.5 percent) and perceived them as representative of real-life situations (96.2 percent). The majority also reported exposure across multiple learning environments, including clinical labs (94.9 percent), tutorials (92.4 percent), and assessments (92.4 percent). However, fewer ākonga (59.5 percent) considered virtual whānau members to be "real people" (Table 3).

Item	Agree n (%)	Disagree n (%)
Can name at least two virtual whānau groups	77 (97.5)	2 (2.5)
Can name at least four members	61 (77.2)	18 (22.8)
Consider virtual whānau members to be real people	47 (59.5)	32 (40.5)
Representative of real-life situations	76 (96.2)	3 (3.8)
Used in clinical labs/simulation	75 (94.9)	4 (5.1)
Used in tutorials/workshops	73 (92.4)	6 (7.6)
Used in assessments	73 (92.4)	6 (7.6)

Table 3. Ākonga familiarity with and exposure to virtual whānau.

Most ākonga reported that the virtual whānau supported their understanding of key concepts of "Te Tiriti o Waitangi," "Te ao Māori," "Cultural safety," and "Legal – ethical practice" (Table 4). at least "somewhat," particularly for legal and ethical practice (45.6 percent "a lot") and cultural safety (36.7 percent "a lot").

Area	Not at all n (%)	A little n (%)	Somewhat n (%)	A lot n (%)
Te Tiriti o Waitangi	9 (11.4)	20 (25.3)	34 (43.0)	16 (20.3)
Te Ao Māori	5 (6.3)	26 (32.9)	30 (38.0)	18 (22.8)
Cultural safety	5 (6.3)	15 (19.0)	30 (38.0)	29 (36.7)
Legal/ethical practice	7 (8.9)	11 (13.9)	25 (31.6)	36 (45.6)

Table 4. Perceived contribution of virtual whānau to conceptual understanding.

Ākonga reported strong support for the application of learning, particularly in clinical simulation and holistic care, where the majority indicated the virtual whānau helped "a lot" (Table 5). While virtual whānau were widely used across teaching contexts, most ākonga indicated a preference for maintaining current levels rather than increasing use. Presentations were the only context where a notable proportion of ākonga preferred their reduced use (20.3 percent) (Table 6).

Application area	Not at all	A little	Somewhat	A lot
Understanding new concepts	2	14	23	40
Applying concepts	2	8	33	36
Clinical labs/simulation	1	6	21	51
Case studies	2	7	21	49
Holistic approach	4	4	21	50
Clinical reasoning	1	6	22	50

Table 5. Perceived support for learning application.

Context	Currently used	Want more	Same	Less
Clinical labs	93.7%	30.4%	65.8%	3.8%
Simulation	87.3%	30.4%	65.8%	3.8%
Tutorials	89.9%	34.2%	60.8%	5.1%
Assessments	81.0%	25.3%	65.8%	8.9%
Presentations	46.8%	26.6%	48.1%	20.3%
Exams	87.3%	22.8%	67.1%	10.1%

Table 6. Current and preferred use of virtual whānau.

To provide a clearer overview of the relative impact across different domains on learning and knowledge application, Table 7 summarises the proportion of ākonga reporting strong perceived impact ("a lot") for each learning area.

Domain category	Specific area	n (%) reporting "a lot"
Clinical application	Clinical simulation / labs	51 (64.6)
	Clinical reasoning	50 (63.3)
	Holistic care	50 (63.3)
	Case-based learning	49 (62.0)
Applied knowledge	Patient presentations	34–42 (43.0–53.2)
	Social determinants of health	35–40 (44.3–50.6)
	Developmental concepts	35–36 (44.3–45.6)
	Patient deterioration	33–38 (41.8–48.1)
Foundational knowledge	Anatomy and physiology	19–21 (24.1–26.6)
	Pathophysiology	20–23 (25.3–29.1)

Table 7. Perceived strong impact ("a lot") of virtual whānau on learning and knowledge application. Note: Ranges reflect multiple related items (for example, application and understanding domains).

Relationships between and across groups

The relationship between composite scales knowledge and understanding, application of knowledge, and clinical preparedness was investigated using Spearman Rank Order Correlation (rho). All three composite scales were positively and significantly correlated ($p < .001$). The strongest relationship was between knowledge and application ($rs = .872$), with application showing the strongest association with clinical preparedness ($rs = .609$). These results support progression from knowledge acquisition to application, with application of knowledge playing a key role in perceived clinical preparedness.

A Kruskal–Wallis test was used to see whether ethnicity groups differed in their responses to two familiarity items (Q.4):

> "I consider virtual whānau members to be real people."
>
> "Virtual whānau are representative of real-life situations."

A significant difference across ethnicity groups in perceptions of virtual whānau as real people was indicated, $H(3) = 15.56$, $p = .001$. Median scores indicated that ākonga Māori (tangata whenua) and tangata tiriti English-second-language (ESOL) ākonga, strongly agreed that virtual whānau members are real people ($Md = 1$), while tangata tiriti English-first-language (EFL) ākonga showed comparatively lower agreement ($Md = 2$). In contrast, there was no statistically significant difference between ethnic groups in how they rated virtual whānau as representing real-life situations, $H(3) = 5.31$, $p = .151$, with all ethnic groups reporting identical median scores ($Md = 1$) suggesting consistent responses across groups.

Kruskal–Wallis tests were also undertaken across composite scales (cultural and professional learning, knowledge understanding, application, and clinical preparedness) to compare ethnicity and ākonga year of BN responses. Significant differences across ethnicity were observed for cultural and professional understanding ($p = .001$) and knowledge understanding ($p = .045$), with tangata tiriti ESOL ākonga reporting higher scores than tangata tiriti EFL ākonga. Tangata whenua ākonga demonstrated similarly strong scores but did not differ significantly from other groups. No significant differences were found for application of knowledge or clinical preparedness.

DISCUSSION

This study shows that the BN virtual whānau supports ākonga to integrate theory into practice. Results of the survey reinforce the themes revealed during focus groups. Overall, ākonga expressed a very positive view on the virtual family as a learning tool. Most respondents indicated that the virtual family supported the understanding of concepts and their application, especially in areas like clinical reasoning, holistic care, and simulated practice contexts. Exposure to the virtual family was common among the teaching approaches across clinical and non-clinical theory courses. Lower perceived impact was found for foundational science topics (such as anatomy and pathophysiology). The ethnic group differences in perceptions of virtual family as "real people" are indicative of cultural-linguistic perspectives shaping how the ākonga relate to simulated or constructed learning stories. This is consistent with cultural learning theory (Leiberman & Kizis, 2026), which maintains that learners are situated in social and cultural contexts, from which meaning is mediated through prior experiences of learning, language, and cultural frameworks.

The general agreement in perceptions of virtual family as reflective of real-life situations indicates mutual recognition of the educational usefulness of such scenarios. Although ākonga may have different emotional or relational ties to virtual family, what they all agreed upon is that they have a usefulness in reflecting real-world clinical contexts. From a bicultural perspective, the virtual whānau enables tangata tiriti (non-Māori) ākonga to consider their own cultural assumptions and apply te Tiriti principles in simulation, while aiming that ākonga Māori see their own cultural reality reflected rather than marginalised. Nursing kaiako can support ākonga reflection through facilitated exploration of bicultural dynamics when using the virtual whānau in relation to their own cultural understanding.

While the virtual whānau supports students from all backgrounds, it needs to focus on a true bicultural partnership rather than just general diversity. This means honoring Māori as tangata whenua so their worldview is not treated as just "one of many" cultures. Findings indicate that the bicultural virtual whānau approach embeds Te Tiriti o Waitangi and culturally safe practice within the BN curriculum, consistent with expectations that cultural safety is grounded in relational practice, critical reflection, and responsiveness to inequity, as emphasised in the Nursing Council of New Zealand's updated guidance (NCNZ, 2026). It is also in line with Tiriti-led curriculum approaches that embed mātauranga Māori and relational ways of knowing in programme design (Severinsen et al., 2023). This suggests that while the virtual whānau model operationalises Te Tiriti o Waitangi within the curriculum, its impact is shaped by learners' cultural positioning, reinforcing the need for intentionally designed, culturally responsive pedagogy that supports reflexivity, inclusivity, and equitable engagement in culturally safe nursing practice. Intentionally embedding tikanga Māori into course delivery and lesson planning can prevent cultural practices being secondary to clinical tasks and theory application.

Ākonga Māori identified significant gaps in the application of Māori avatars and virtual whānau. Specifically, ākonga Māori noted an incongruence between authentic representation and reliance on cultural stereotypes, emphasizing that oversimplified profiles do not reflect the diversity of Māori experiences. Participants also felt that tikanga was sidelined in simulation labs, as task-focused clinical goals often took priority, reducing tikanga to a "box-ticking" exercise (Marsh, 2020). Additionally, ākonga highlighted the lack of whānau involvement and whanaungatanga. In actual clinical settings, Māori patients are surrounded by collective support networks, whereas virtual whānau members in simulations usually appear alone, removing key relational elements. Finally, participants called for deeper integration of mātauranga Māori. They advocated for region-specific details, such as whakapapa, hapū, iwi, dialect, and local tikanga, and praised the use of frameworks like Te Wheke (Pere, 1984) for supporting comprehensive holistic care. "Whanaungatanga" and having a "culturally responsive environment that affirms cultural identity," have been identified as positively supporting ākonga Māori nurses' achievement (Gray, 2021, p. 68). Purposeful application of tikanga requires consideration of how profiles and backgrounds information for Māori virtual whānau members best reflect te ao Māori with purposeful inclusion of tikanga practices in the development, planning, and delivery of teaching that includes the virtual whānau to avoid "tick-box Māori" (Marsh, 2020) approaches.

No genuine engagement with kaiako or ākonga Māori external to Māori course lecturers has occurred since 2018 when the Māori virtual whānau family names were reviewed, other than as part of this research. The authors were concerned that Māori virtual whānau must represent te ao Māori as authentically as possible, being cognisant of potential cultural appropriation. Aspects of the BN virtual whānau are seen by ākonga Māori as supporting mātauranga Māori, yet there

are many areas where authentic representation could be improved. This tension is particularly evident in face-to-face actor simulations. When non-Māori actors depict Māori virtual whānau members, it creates a potential breach of bicultural integrity that ākonga Māori readily identify. This does have limitations, especially within the simulation environment using actors, which ākonga Māori recognised that for practical reasons authenticity could not always be overcome. Ongoing engagement and partnership with ākonga Māori, kaiako Māori, and external hapū and iwi is needed to guide authenticity to avoid cultural appropriation.

Together, these findings suggest that while virtual whānau are effective in supporting shared understanding of clinical realism, educators should consider how authentic representation can strengthen a sense of connection and authenticity for ākonga. Resolving these practical limitations requires pedagogical transparency and intentional debriefing that explicitly addresses bicultural dynamics, power structures, and the boundaries of simulation. Enhancing authentic representation, incorporating diverse narratives, and explicitly supporting cultural meaning-making may help ensure that all ākonga can engage with virtual whānau in ways that are both educationally meaningful and culturally responsive. Further development of Māori whānau members may include whakapapa, and discussions of how we best represent Māori whānau members within kanohi ki te kanohi (face to face, in person) simulations in partnership with ākonga Māori, kaiako Māori, and external hapū and iwi.

LIMITATIONS

This research involves a specific teaching and learning strategy and resource within our BN programme. Nonetheless, we believe the findings indicate the benefit of an all-curriculum approach to virtual whānau across all theory and clinical courses. Participant recruitment for focus groups was impacted by timing of clinical practicums, and for the survey end of year exams and holiday breaks. The survey response rates were less than 30 percent for the potential participant group. However, the high percentages of positive responses indicate that these may still reflect the overall ākonga group.

CONCLUSION

Overall, despite differences in perceived authenticity and cultural learning, all groups demonstrated consistently strong agreement that virtual whānau are representative of real-life situations, indicating shared recognition of their clinical relevance. When considered alongside the strong correlations between knowledge, application, and clinical preparedness, these findings suggest that virtual whānau effectively support cognitive and applied learning across groups, while also revealing variation in relational engagement. Collectively, this research underscores the importance of designing learning experiences that are not only clinically authentic but also culturally responsive, ensuring that diverse learners can meaningfully connect with, and benefit from, educational approaches grounded in Te Tiriti o Waitangi principles and culturally safe practice. Authentic representation within the virtual whānau serves a clear pedagogical purpose: it moves beyond mere realism to embed Te Tiriti o Waitangi directly into nursing education. By incorporating bicultural co-design, tikanga, and structured self-reflection, this platform evolves from a routine simulation tool into a transformative model for teaching bicultural safety and health equity in Aotearoa.

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DESIGNING FOR SCHEMA DEVELOPMENT: INTEGRATING LEARNING THEORY AND NEUROSCIENCE

Katherine Danaher and Amy Benians

INTRODUCTION

With modern advances in neuroscience, it has become possible to identify and track brain functions related to learning as never before. However, while this may expand our understanding of how learning occurs, it does not mean that traditional learning theories such as cognitivism, constructivism, and socio-constructivism have lost their relevance.

In particular, neuroscience has posited some possible physical mechanisms for the cognitive framework of schema theory. Schema theory, originating in the work of Bartlett (1932) and further developed by Piaget (Wadsworth, 1971) and cognitive psychologists, proposes that knowledge is organised into interconnected constructs that support interpretation, memory, and prediction (Bein & Niv, 2025; Greve et al., 2019).

This article argues that the schema concept provides a useful integrative framework for learning design. Drawing on educational theory and recent neuroscientific evidence, it proposes that learning designers can intentionally support schema activation, development, modification, and transfer through carefully designed learning experiences.

First, a note about terminology: cognitivism focuses on learning through mental processing and creating memory structures, while constructivist and socio-constructivist perspectives on learning emphasise meaning-making through experience and social interaction, respectively. Together, these perspectives offer complementary insights into schema learning, as we will describe below.

WHAT IS A SCHEMA?

A schema is a figurative concept used to refer to an associative network that organises, categorises, and interprets information about an aspect of the world we live in. You can think of a schema as a folder within a filing system that stores all concepts and memories related to that aspect. A schema might be of a process or procedure (for example, checking in for a flight), or of a tangible concept (for example, having a dog as a pet). Your schemata (plural of schema) allow you to group related information and retrieve this information when faced with a familiar or unfamiliar situation, to generate expectations that predict and make sense of novel experiences. Schemata are adaptable; they can incorporate fitting information (assimilation) and non-fitting information (accommodation) (Armelin et al., 2017; Wadsworth, 1971). Therefore, "schema learning" has been conceived as the process of first activating, then modifying schemata.

Schema components are stored as neural assemblies called engrams that are the smallest units of memory or learning (Andonovski, 2024; Guskjolen & Cembrowski, 2023). While schemata are figurative constructs, an engram is a physical cluster of neurons connected by synapses. Initial learning takes place in the hippocampus, laying down engrams in this brain region known to be important for memory. The engrams of a schema remain connected, while distantly located across different brain regions as "mental files" (Andonovski, 2024). For example, a schema for "dog" might include the sound of barking (stored in the auditory cortex), the appearance of a dog (stored in the visual cortex), and associated memories of interactions with dogs (stored in other brain regions involved in long-term memory). These engram neurons are scattered across distant brain regions like constellations in the night sky. Emerging evidence shows that initial hippocampal engrams are reactivated during memory retrieval (Guskjolen & Cembrowski, 2023) and orchestrate the activation of more distant engrams in the broad schema, allowing the brain to reconstruct the full concept from distant neural traces (Andonovski, 2024; Reijmers et al., 2007).

Understanding this relationship between schemata and their physical substrates helps to narrow the gap between theoretical predictions made by cognitive psychologists and tangible advances made by neuroscientists. The process by which entirely new schemata are formed remains incompletely understood. Keeping this in mind, in this article we attempt to bring together schema theory and neuroscientific developments to explain how learning design strategies can support learning through schema development. First, we consider how to strengthen new schemata; then how to activate schemata, and finally how to change existing schemata.

DESIGNING FOR SCHEMA STRENGTHENING

Learning takes place when new information comes into the working memory (a short-term cache that is limited in capacity), and is able to be encoded, which means that it is transferred to long-term memory. Importantly, encoding does not simply mean storage: it means integration into a connected schema (Greve et al., 2019; van Kesteren et al., 2012). Schemata are constructs within long-term memory; they are not synonymous with long-term memory itself but rather represent the way knowledge is organised and interconnected. In order to integrate the new information, a relevant schema needs to be retrieved from long-term memory into working memory. This process of retrieving and encoding has a number of implications for learning design. First, it is important not to overload the working memory by introducing too much new information at once. This relates to cognitivism's well-researched cognitive load theory (Sweller et al., 2019), whose premise is that working memory capacity is relatively fixed for any given individual and that cognitive effort depletes working memory. Second, connecting new information to existing schemata is helpful for long-term retention. This connection can be achieved through designing activities that require learners to explain, compare, or justify.

Third, new learning that is not yet well-established within a schema needs to be consolidated. This is a process in which the repeated retrieval of the information item reactivates the relevant schema and thereby strengthens neural connections throughout the corresponding engram (Oakley, 2026; van Kesteren et al., 2012). A well-established cognitivist strategy for strengthening and consolidating schemata is spaced practice, whereby learning and retrieval opportunities are distributed over time rather than massed together (Yang et al., 2025).

One learning design approach favoured by cognitivists (and many constructivists) that can combine cognitive load management, retrieval practice, and spaced learning is direct instruction, shown in

Figure 1. Direct instruction includes active learning, which is strategically interspersed with more traditional knowledge transfer ("teacher-led learning").



Figure 1. Direct Instruction has advantages of both teacher-led learning (fast, direct knowledge transmission) and active learning, which is more engaging and allows for practice of the new skill, concept, or knowledge (for example, cognitivist approaches of retrieval and rehearsal).

DESIGNING FOR SCHEMA ACTIVATION

There is general agreement among cognitivist and constructivist educators and researchers that knowledge is actively constructed in the mind of the learner by building on their prior knowledge. The role of the teacher is often to activate relevant prior knowledge, conceptualised here as schemata. Activating prior knowledge before learning facilitates subsequent memory consolidation (Brand et al., 2025). Schemata can be activated when a familiar cue is provided, such as related information in that schema (Brand et al., 2025). Neuroscientists have shown that this triggers activation of the same neurons that encoded that memory; that is, the initial engram neurons located in the hippocampus (Reijmers et al., 2007). Over time, consolidation of learning can extend these memories from the hippocampus, where they can be found in cortical regions of the brain (Hebscher et al., 2019). Guskjolen and Cembrowski (2023) further explain how activating relevant schemata occurs in cortical regions, first through the hippocampal engram neurons involved in the initial memory encoding. The hippocampal engram neurons in turn re-excite cortical engrams in the broader schema, which are largely stored in the medial prefrontal cortex and other cortical regions. This has been likened to an indexing function of the hippocampus, which explains why contextual cues are so effective at triggering schema activation: the hippocampus uses such cues to locate and retrieve the relevant schema, so bringing it into working memory (Guo et al., 2023; Guskjolen & Cembrowski, 2023).

How, then, can we design for schema activation? The important principle is to retrieve familiar knowledge or skills before building new ones. However, there is still discussion in the literature about how much prior knowledge needs to be elicited to prime the system for learning without overwhelming learners (Brand et al., 2025). From their studies of teaching maths to school students, Brand and colleagues conclude that "effective preparation for instruction is not about how much relevant prior knowledge is activated, but is about striking the right balance: too little may leave students unprepared, too much can be overwhelming, but just the right amount prepares students optimally for learning" (Brand et al., 2025, p. 1654). Establishing a practice of reviewing foundational learning before embarking on more advanced learning is a solid strategy that will activate and strengthen relevant schemata.

Questioning offers a further route to schema activation. A well-formed question can help direct learners' attention and define the scope of what is being considered, prompting them to retrieve relevant prior knowledge structures into working memory (Oakley et al., 2026). By narrowing the field of consideration in this way, questioning may provide a framework for interpreting new information and support deeper understanding.

DESIGNING FOR SCHEMA MODIFICATION

Schemata are not fixed structures, but are constantly being modified as new information comes to hand. In Piaget's early work, he described how they can be updated with fitting, congruent information ("assimilation") and also incorporate contrasting or incongruent information by "accommodation" (Wadworth, 1971). This dichotomy is explored by Greve and colleagues (2019) who propose distinct mechanisms: assimilation occurs at the encoding level, through reactivation and strengthening of existing schema, as described earlier. Accommodation occurs at a post-encoding level through prediction and error detection (Greve et al., 2019).

Neuroscientific evidence summarised by van Kesteren et al. (2012) shows that presenting new information that violates a schema activates the medial prefrontal cortex. They propose that this brain region plays a role in detecting whether new information is congruent with existing schemata located in other parts of the brain's cortex. Armelin et al. (2017) found the hippocampus also plays a vital role in accommodation. The emerging process relies on a prediction-error mechanism: first learners retrieve an existing schema, then they use it as a neural template to make a prediction; any mismatch between the prediction and the reality represented by the new information triggers schema revision (Bein & Niv, 2025).

Bein and Niv (2025) hypothesise that schema learning aligns well with the computational model of "reinforcement learning," for instance in how we update existing schemata by detecting prediction errors. Reinforcement learning, when applied analogously to human rather than machine learning, relies on experience: a prediction error is detected when actual experience differs from the predicted experience. When an experience cannot be adequately explained by any existing schema, and is sufficiently different from similar observations, the brain may create a new schema (Bein & Niv, 2025). For example, an outlier might become an entirely new schema, or might be assigned into the 'exceptions-to-the-rule' schema. This fits with Piaget's initial conception that accommodation involves both the creation of new schemata, and the modification of old schemata (Wadsworth, 1971), the biological mechanisms for which are now starting to be better understood.

The recognition of discrepancies caused by prediction errors can produce the familiar "Aha!" experience associated with lightbulb moments of new learning. Aha! moments, comparable to Piaget's "cognitive disequilibrium" (Oakley et al., 2026, p. 18), are likely to generate the productive dissonance necessary for schema revision. These moments of insight result in the release of dopamine and norepinephrine (Tik et al., 2018). As well as supporting memory formation, these consequent neurochemical responses are associated with positive affect and may contribute to our intrinsic motivation for learning.

This process of accommodating new information and insights raises the question of how learning designers can facilitate the updating of schemata. Experiential learning strategies are particularly effective at supporting accommodation because they involve concrete experience and require learners to reflect. In light of the above, we propose additionally requiring learners to make and test predictions, making mismatches explicit, followed by opportunities to reflect on mismatches between new and prior knowledge.

A socio-constructivist perspective acknowledges the importance of collaboration and social interactions. Learners may re-negotiate and co-construct meaning, or "arrive at self-chosen positions to which they can commit themselves, while realising the basis of other views with

which they may disagree" (Cunningham, 1991, p. 14). Designing for socio-constructivist learning can support adult learners to recognise multiple perspectives, providing opportunities to adapt their schemata. Collaborative learning can accelerate this process further: observing peers' different predictions and choices helps learners recognise discrepancies they might not have noticed independently.

DESIGNING FOR TRANSFER OF LEARNING THROUGH SCHEMA APPLICATION

Transfer of knowledge is vital in tertiary education where our learners will need to transfer and apply newly acquired knowledge to future, unknown problems. The classical cognitive view of transfer assumes that context sits alongside, or can be separated from, the initial learning of content (Nokes-Malach & Richey, 2015). However, constructivists posit that new knowledge is "embedded" within the context in which it is learnt: that is, learning is said to be "situated" within contexts (Brown et al., 1989; Lave, 1988). In most tertiary institutions, learning needs to take place in classrooms and lecture theatres; therefore, transfer of learning to future professional contexts is essential.

Nokes-Malach and Richey (2015) describe teaching strategies for effective transfer through comparison; that is, asking learners to compare and contrast case studies by detecting common structural features, while ignoring distracting differences. This creates an "abstract schema" that allows learners to solve problems with similar surface features (Nokes-Malach & Richey, 2015, p. 5).

The learning design approach favoured by constructivists is known as "anchored instruction," which includes, but is not limited to, framing the learning around a problem to be solved (Li et al., 2023). If we apply a schema lens to anchored instruction, we first draw on the concept of a schema as a neural template that captures common structural features across experiences (Bein & Niv, 2025). The more abstract and flexible the schema becomes, the more readily it can support generalisation to novel situations. For the learning designer, there are numerous ways that transfer of learning can be promoted, such as contrasting cases, varied contexts, interdisciplinary projects, simulations, and authentic assessment. Thus, the learner repeatedly retrieves and adapts the same theoretical schema in different situations, making transfer more likely.

CONCLUSION

Schema development provides a useful integrative framework for learning design, bringing together insights from cognitivism, constructivism, and socio-constructivism. While each theory offers a different perspective on how learning occurs, all contribute to the activation, development, modification, and application of schemata. Recent advances in neuroscience have begun to reveal the biological mechanisms that may underpin these processes, providing additional support for many established educational practices.

What, then, does a schema-informed approach to learning design look like? First, it promotes activation of schemata by helping learners identify and retrieve relevant prior knowledge. It encourages the efficient development and consolidation of schemata through a combination of direct instruction, experiential learning, and spaced practice. Attention is paid to cognitive load so that working memory can effectively connect new information to existing knowledge structures. The dynamic nature of schemata is acknowledged through opportunities for questioning, prediction,

comparison, and the recognition of dissonance, all of which support schema modification. Finally, transfer of learning is promoted through authentic, varied, and collaborative learning experiences that encourage learners to apply and adapt schemata across contexts.

Effective learning design should therefore:

1. Activate prior knowledge.
2. Connect new information to existing schemata.
3. Manage cognitive load.
4. Provide retrieval and spaced practice.
5. Create opportunities for prediction and prediction error.
6. Support transfer across contexts.
7. Facilitate collaborative refinement of schemata.

Contemporary neuroscience does not replace learning theory; rather, it provides biological explanations for why many established learning design approaches remain effective.

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THE DUAL ROLE OF FACILITATOR AND LEARNING DESIGNER: DESIGN DECISIONS AND BLIND SPOTS

Clare Morton

INTRODUCTION

Facilitators who also hold a role as a learning designer, referred to here as dual role practitioners, can apply design principles to help produce a learning experience that is engaging for and relevant to their ākonga. Being a dual role practitioner can give you the benefit of knowing who your ākonga are and what learning design decisions would suit them. However, a dual role can also cause blind spots. Assumptions could be made about what works for your ākonga without checking that it is grounded in good learning design. This article will explore this effective learning design and blind spots using a hypothetical practical workshop as an example. This is a one-day, hands-on, facilitated workshop that is part of a series of workshops aiming at covering one topic per session. Ākonga will already be familiar with the concepts explored within the workshop—this article brings these concepts together through practical application.

Context

I am a tertiary lecturer who has a role as a facilitator and learning designer. This means that I facilitate courses and revise existing content to improve its visual and learning design aspects. Having both roles has changed how I view my role as facilitator, as I now look at the existing material through a design lens rather than just a delivery lens. This helps me to see the material as the ākonga would see it.

The example used throughout this article is a hypothetical scenario based on a flower composting workshop focusing on practical techniques for a small flower farm.

THE LEARNING AND TEACHING SEQUENCE

The workshop is held on a weekend to allow ākonga to attend who would otherwise be working. The teaching and learning sequence was developed by the facilitator who was taking the workshop and the learning design principles were applied by that same facilitator, allowing the dual role to work.

The first part of the workshop builds engagement based on a Universal Design for Learning (UDL) framework (CAST, 2024) and develops connections through whakawhanaungatanga, bringing together ākonga who share similar interests and values (Mead, 2003). Once that connection has been made, they are more ready to engage with the content and learning, and the workshop

moves into setting goals for the day. Setting goals in a practical workshop helps to make the learning feel real and motivates ākonga to participate in the workshop. Finally, discussing health and safety not only develops awareness as required for compliance, but also helps to establish trust that the workplace is safe, which then leads to a feeling of security.

The second part of the morning session combines practical demonstrations with discussions. This cycle of demonstrate, discuss, and practice helps the facilitator control the direction of the learning. Breaking the learning into small, manageable steps makes the content easier for ākonga to understand. UDL principles are represented here by presenting the content through live demonstrations, an infographic, and step-by-step verbal instructions to appeal to the different ways ākonga engage with the content.

Sharing lunch in the middle of the day reinforces connections within a group aligned around the same goals. Exchanging stories and sharing kai builds relationships and promotes a sense of belonging: the value of whanaungatanga.

The afternoon's structure mirrors the morning session, bringing familiarity to the workshop so the ākonga feel comfortable following the same progression. The reflection at the end of the session is based on the UDL engagement principles to help ākonga self-regulate their own progress and motivation. This allows ākonga to reflect on what they have learnt throughout the workshop and how they can use this learning in the future. The wrap-up at the end of the session allows for final thoughts and future planning for the next workshop.

THEORETICAL GROUNDING

A teaching and learning sequence and a well-suited infographic for a practical workshop draw on key learning theories and models. These all work together to create a learning environment that is ākonga-centred and helps to promote understanding, confidence, and authentic skill development.

The foundation of a practical workshop is grounded in social constructivism (Vygotsky, 1978), which views learning as a social and interactive process. This approach supports quality learning by fostering collaboration, dialogue, and shared activities—central elements of effective adult education (Brookfield, 2017; Tertiary Education Commission, 2020). When ākonga work together through discussion and practical activities, they co-construct knowledge by linking new information to prior experiences (Fosnot, 2013). Practical activities provide immediate application and feedback, while collaboration enables ākonga to clarify thinking through dialogue, reflection, and peer support.

Alongside this social approach, the workshop design reflects cognitive load theory (Sweller, 1988), which contributes to quality learning by ensuring instructional materials support comprehension and reduce unnecessary mental effort. Managing cognitive load enables ākonga to focus on essential concepts, promoting understanding rather than confusion (Sweller et al., 2019). Clear graphics, bullet points, and plain icons on the infographic, combined with step-by-step facilitator demonstrations, reduce extraneous cognitive demands, and enhance engagement. Freeing cognitive resources allows ākonga to focus on collaboration and practical problem-solving, complementing the social constructivist approach.

As described above, a Universal Design for Learning framework (CAST, 2024) is applied to ensure that information is accessible in multiple ways. UDL Guidelines 3.0 promote engagement,

representation, and action and expression. In a practical workshop, ākonga engage through visual (infographic), auditory (facilitator explanation), and kinaesthetic (practical hands-on) modes. Ākonga demonstrate understanding through collaborative practice and problem-solving rather than solely through verbal or written responses. Providing multiple avenues for engagement and expression ensures inclusion, accessibility, and meaningful participation, reinforcing that knowledge is actively constructed.

Designing a teaching and learning sequence requires a deliberate commitment to diversity and inclusivity and learning design principles rather than simply relying on facilitator instinct. By incorporating a range of instructional methods—including group discussion, facilitator demonstrations, visual resources, and practical activities—ākonga can engage in ways that suit their individual strengths and learning styles (CAST, 2024). This variety maintains interest and motivation while promoting equitable access, reflecting widely recognised principles of effective adult learning (Brookfield, 2017). The integration of multiple means of engagement, representation, and expression reduces barriers and allows ākonga to demonstrate understanding in diverse ways, supporting a high-quality learning experience for all participants.

Key to this commitment to diversity and inclusivity are the mātauranga Māori principles of whanaungatanga and whakawhanaungatanga, which foster connection, belonging, and reciprocity through both the cultivation of relationships and the relationships that result from them (Ako Aotearoa, 2023). These principles are woven through the workshop introduction and shared kai, encouraging interaction, reflection, and relationship-building—important aspects of culturally responsive learning. The principle of ako is demonstrated as learning becomes reciprocal: ākonga share prior knowledge and experiences while the facilitator guides, models, and learns from their insights. This mutual exchange reinforces collaborative learning, ensuring knowledge is co-constructed rather than delivered in a one-way format. Integrating these mātāuranga Māori principles alongside social constructivist and UDL principles strengthens inclusivity and engagement, supporting a high-quality learning experience.

Connecting all these elements across both the workshop and infographic results in a learning experience that is theoretically grounded and practically effective. Social constructivism and collaborative learning foster participation, shared understanding, and relevance; cognitive load theory and UDL ensure cognitive clarity, accessibility, and inclusivity; and whanaungatanga, whakawhanaungatanga, and ako bring depth through cultural connection and reciprocal learning. Together, these approaches provide multiple avenues for engagement, reflection, and knowledge construction, particularly when the designer and facilitator are in a dual role.

THE INFOGRAPHIC AS A LEARNING TOOL

The infographic includes images and colours that relate to the workshop content, along with smaller chunks of information to help ākonga who need a visual guide to support their learning, providing multiple means of representation in line with the UDL guidelines. Breaking the information into smaller visual pieces reduces cognitive load and helps with learning. A dual-role practitioner's experience then draws on both design training to understand what works visually, such as colour matching, arrows, and chunked information, and facilitation experience (when and how to introduce the infographic). This combined knowledge helps to create an infographic that suits the learning needs of ākonga.

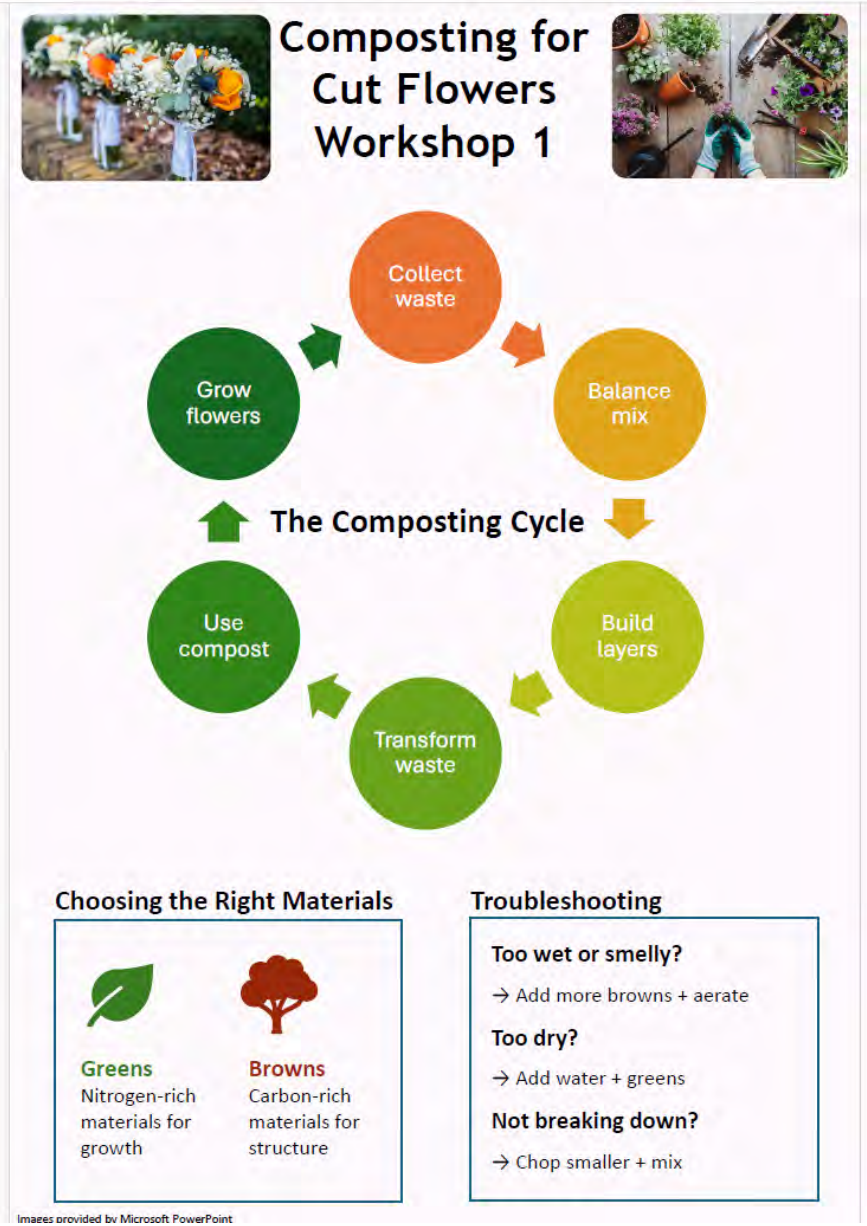


Figure 1. Infographic designed for flower composting workshop illustrating the key steps, with boxed text on choosing the right materials and troubleshooting to support ākonga engagement.

THE DUAL ROLE IN PRACTICE

Being a facilitator and a learning designer brings both strengths and challenges when it comes to designing a quality learning experience. An experienced dual-role practitioner knows the content and how to facilitate a well-run teaching session, leading them to understand the learning design needed for teaching. They can then produce learning materials that are grounded in both content knowledge and learner needs.

The roles of learning designer and facilitator are interconnected. The relationship between the two means that learning how to be a designer can change the approach to creating learning materials beyond just relying on the facilitator's experience. From a facilitation perspective, this includes knowing how to sequence the learning, along with noticing when ākonga need a break and being able to adjust the learning accordingly. From a design perspective, this means introducing new approaches to teaching materials such as using simple colours, white space, and consistent spacing using rulers and gridlines. By contrast, a facilitator using another's design plan may feel more constrained to follow that plan rather than using their experience to judge how ākonga are responding and adjusting the learning to suit.

Overcoming limitations

Issues in design can arise when facilitators are too close to the content and rely on assumptions about what works, even if based on their experience, rather than on solid design principles. A facilitator might equate more content with better learning, for example; however, this can overwhelm ākonga and increase extraneous cognitive load. A facilitator can guard against these blind spots by deliberately applying learning design principles throughout their learning materials and by having the content peer-reviewed by another learning designer. A review should be carried out to ensure that learning design principles have been applied, rather than just to check the content. Designers should look for design inconsistencies throughout the learning materials and ensure that cognitive load is managed by reducing clutter in the materials.

However, a dual role may not be realistic in an organisation where facilitation and learning design roles are structured separately. For a dual role practitioner to be effective, they first need to be taught learning design principles and then continuously apply that knowledge to build up their skill level. Support and allocation of workload would need to be considered by an organisation if dual-role practitioners were to be introduced. An alternative approach could be to have dedicated learning designers who bring more specialist knowledge and experience working alongside experienced facilitators to ensure both facilitation and learning design principles are met. This process would mean both designer and facilitator are learning from each other and working to create a learning experience that meets the needs of ākonga.

CONCLUSION

A quality learning experience is engaging and inclusive, with content that is relevant and meaningful to ākonga. Being both a facilitator and a learning designer is possible, and can produce quality learning experiences, but it does require a good understanding of design principles and how to apply those to learning materials. When a dual practitioner goes on to facilitate the course they have designed, this investment deepens further. Teaching your own materials means seeing them through the eyes of ākonga in real time: you are uniquely positioned to care about whether they

truly work. Blind spots must be acknowledged and recognised by facilitators when designing learning materials and appropriate steps must be taken to mitigate these challenges. However, facilitators who find themselves in a dual role can, through their knowledge and experience, create high-quality learning materials grounded in learning design principles.

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DESIGNING AI-SUPPORTED FLIPPED PROFESSIONAL DEVELOPMENT FOR TEACHERS

Ghina Albadawi and Sahar Chaer

INTRODUCTION

Teacher professional development has increasingly evolved toward digitally mediated, learner-centered models that emphasise flexibility, collaboration, reflective practice, and sustained engagement. Advances in educational technology, combined with changing conceptions of adult learning, have challenged traditional transmission-oriented approaches to professional learning and encouraged the development of more interactive and participatory models (Darling-Hammond et al., 2017). More recently, AI-supported learning environments have expanded opportunities for personalised, flexible, and continuous professional development, enabling teachers to engage in self-paced learning, collaborative inquiry, and reflective practice across diverse educational contexts (Holmes et al., 2019). Contemporary research further suggests that effective technology-enhanced professional learning environments are characterised by coherence, active participation, and ongoing reflective engagement rather than isolated training events (Bond et al., 2021).

Problem statement and study aim

The rapid evolution of digital technologies has transformed professional learning, particularly teacher development. Traditional professional development, often characterised by passive knowledge transmission and limited interaction, has been challenged for its limited impact on instructional practice (Desimone & Garet, 2015). In response, there has been a shift toward dynamic, adult learner-centered approaches emphasising engagement, reflection, and practical application in contemporary educational contexts worldwide (Darling-Hammond et al., 2017).

Within this context, flipped learning has emerged as a promising pedagogical model. By relocating engagement with course content to asynchronous environments and dedicating synchronous sessions to interactive, application-oriented activities, flipped learning supports active participation and deeper learning (Bergmann & Sams, 2012). Flipped learning has been widely adopted in student learning contexts, while its application in teacher professional development has gained traction more recently (Han & Røkenes, 2020).

Simultaneously, artificial intelligence (AI) technologies have begun to influence educational design in meaningful ways. AI tools support personalised learning, provide adaptive feedback, and facilitate structured reflection, thereby enhancing the learning experience (Luckin et al., 2016). Despite increasing interest in AI, empirical research examining its integration into teacher professional learning within structured flipped learning models remains limited (Copur-Gencturk et al., 2024).

Taken together, these developments highlight a gap: although flipped learning and AI-supported education have demonstrated potential in enhancing learning experiences, limited empirical research has examined their integration within structured teacher professional development frameworks (Tammets & Ley, 2023). This study addresses this gap by examining the design and implementation of an AI-supported flipped professional development model for teachers. Rather than focusing solely on evaluating the effectiveness of the training, the study adopts a learning design perspective, exploring how pedagogical structuring, AI integration, and reflective processes interact to shape the adult learning experience.

Research questions

To investigate the pedagogical and experiential dimensions of the AI-supported flipped professional development model, the study addresses the following research questions:

RQ1: How does an AI-supported flipped learning design influence teachers' engagement in professional development activities?

RQ2: How do teachers perceive the role of AI-assisted learning activities within the different phases of a flipped professional development model?

LITERATURE REVIEW

This literature review explores research on flipped professional development and AI-supported teacher learning to establish the rationale for investigating how AI can be intentionally integrated within flipped models of teacher professional development. Flipped learning has been widely adopted as a pedagogical model that shifts direct instruction outside formal learning sessions and reallocates synchronous time for active learning, collaboration, and application (Kapur et al., 2022). In the context of teacher professional development, this model has gained interest as it aligns with adult learning principles that emphasise self-direction, relevance, and experiential engagement (Knowles, 1984).

Empirical research indicates that flipped professional development enhances teacher engagement and ownership of learning by allowing their flexible access to preparatory materials and enabling deeper interaction during face-to-face or synchronous sessions (Fidan, 2023; Sointu et al., 2022). Teachers in flipped professional development environments often demonstrate higher levels of participation in collaborative activities and report increased relevance of training content to classroom practice (González-Zamar & Abad-Segura, 2022).

However, several limitations remain. These include inconsistent completion of pre-session tasks, variability in teachers' digital literacy, and limited institutional structures to support sustained engagement (Sointu et al., 2022). Additionally, most flipped professional development models rely on static instructional materials, with limited integration of adaptive or intelligent systems that respond to individual teacher needs (Schmid et al., 2023).

AI is increasingly reshaping professional learning ecosystems by enabling adaptive feedback, personalised scaffolding, and reflective dialogue. In education, AI applications have been used to support lesson planning, formative feedback, and data-driven instructional decision-making (Holmes et al., 2019). Generative AI systems have introduced new possibilities for teacher professional learning by acting as interactive cognitive partners rather than passive tools.

These systems can prompt reflection, suggest alternative pedagogical strategies, and support metacognitive awareness by making instructional reasoning explicit (Kasneci et al., 2023), thereby positioning AI as a co-constructive learning agent rather than a content-delivery tool.

Nevertheless, AI-in-education research continues to be dominated by applications focused on student learning, adaptive tutoring systems, and classroom-level personalisation, with comparatively limited attention to structured teacher professional development (Erhardt et al., 2026).

Existing literature reveals three key gaps. First, limited research has examined the integration of AI-supported scaffolding within flipped professional development, where models still rely largely on static pre-learning materials. Second, AI-in-education research remains predominantly student-centered, with limited attention to teacher professional learning (Erhardt et al., 2026). Third, empirical studies on AI-supported professional development remain limited in resource-constrained contexts such as Lebanon, where infrastructural and institutional constraints affect implementation. Accordingly, this study investigates an AI-supported flipped professional development model implemented across multiple teacher groups and learning phases.

THEORETICAL FRAMEWORK

This study is grounded in Kolb's (1984) experiential learning theory, which conceptualises learning as a four-stage cyclical process involving: concrete experience or feeling, reflective observation or watching, abstract conceptualisation or thinking, and active experimentation or doing. This framework is particularly relevant to professional learning, where meaningful development occurs through the integration of theory and practice.

The flipped learning model structure aligns closely with this experiential cycle. The asynchronous pre-learning phase supports abstract conceptualisation by introducing participants to core concepts before live interaction. Synchronous sessions provide opportunities for concrete experience and active experimentation through discussion and collaborative problem-solving. The reflective phase promotes reflective observation by encouraging participants to analyse their experiences and connect them to theoretical frameworks.

The study also draws on learning design principles that highlight intentional sequencing, coherence across learning phases, alignment between activities and pedagogical goals, and integration of reflection as a central component of learning (Goodyear, 2015).

Within this framework, AI is conceptualised as a scaffold that supports cognitive and metacognitive processes. AI-generated prompts are used to guide participants' engagement with content, stimulate critical thinking, and structure reflective practices. This approach aligns with constructivist perspectives, which emphasise the role of guided interaction in knowledge construction (Vygotsky, 1934/1978).

AI-SUPPORTED FLIPPED TRAINING DESIGN FRAMEWORK

The AI-supported flipped training design framework examined in this study was developed by the Education Resource Center (ERC) at a Lebanese educational institution. The framework was designed to sustain professional learning during periods when in-person training became difficult because of the ongoing war in Lebanon. The AI component of the framework consisted of

generative artificial intelligence (GenAI) tools, specifically Microsoft Copilot and ChatGPT, which were integrated as pedagogical scaffolds to support cognitive engagement, reflective practice, and professional dialogue. These tools were not used as autonomous instructional systems or adaptive learning platforms; rather, they were intentionally incorporated by trainers to enhance participants' interaction with learning content and reflective activities.

The model integrated flipped learning with GenAI-supported cognitive and reflective scaffolding across asynchronous, synchronous, and reflective phases. Microsoft Copilot and ChatGPT were used to generate prompts, reflective questions, and discussion supports that encouraged participants' questioning, analysis, and metacognitive engagement throughout the learning cycle.

The framework was implemented across five professional development courses conducted between February and July 2025. It consisted of three interconnected phases: pre-learning, interactive learning, and reflective learning. Each phase served a distinct pedagogical purpose while contributing to an integrated professional learning cycle.

Pre-learning phase

The pre-learning phase represented the foundational stage of the framework. Before attending live sessions, participants engaged with asynchronous materials including videos, readings, guided tasks, and GenAI-supported prompts developed through Microsoft Copilot and ChatGPT focusing on key concepts and questions. This phase aimed to activate prior knowledge, encourage self-paced engagement, and prepare participants for collaborative interaction during synchronous sessions. Microsoft OneNote functioned as the primary platform for hosting resources, assignments, and preparatory materials. While OneNote served as the organisational and content delivery platform, Microsoft Copilot and ChatGPT were incorporated within selected activities to provide GenAI-supported prompts and reflective questions. Thus, OneNote functioned as the learning environment, whereas GenAI tools served as cognitive scaffolds embedded within the instructional design. Trainers shared instructional content in advance to allow participants sufficient time to engage with concepts before attending live discussions. The framework emphasised clarity of expectations, structured sequencing of content, and alignment between asynchronous tasks and synchronous activities. GenAI-generated prompts were integrated to scaffold participants' engagement with content by encouraging questioning, analysis, and conceptual exploration. These prompts supported cognitive preparation and helped participants arrive at live sessions with preliminary ideas and reflections already formed.

Interactive learning phase

The interactive phase consisted of synchronous sessions conducted through Microsoft Teams. Live sessions emphasised collaborative discussion, practical application, problem-solving, and shared reflection rather than direct content transmission. Trainers facilitated interactive activities that connected asynchronous learning with authentic professional contexts, monitored engagement, supported participants with low attendance or participation, and maintained ongoing communication throughout the course implementation process.

Communication channels such as WhatsApp groups supported continuity between sessions through reminders, clarifications, provision of additional resources, and follow-up interaction. Microsoft Copilot- and ChatGPT-supported questioning strategies and reflective prompts were used selectively to deepen dialogue, encourage analysis, and sustain engagement during

collaborative activities. These tools supported discussion and reflection but did not replace trainer facilitation or function as automated instructional agents.

Reflective learning phase

The reflective phase extended learning beyond synchronous participation. Reflection was an intentionally designed process rather than an incidental outcome of training experiences. Participants engaged in reflective assignments, feedback cycles, and GenAI-supported reflective activities using Microsoft Copilot and ChatGPT to promote deeper examination of instructional practices and professional learning experiences.

Microsoft Copilot- and ChatGPT-generated reflective prompts and case-based scenarios were integrated to guide participants' analysis of classroom applications, instructional decisions, and learning outcomes. These prompts encouraged metacognitive engagement by helping participants connect theoretical concepts to authentic educational contexts and examine the implications of newly acquired strategies for practice.

The framework also emphasised continuous feedback and individualised support. Trainers provided constructive feedback on assignments and reflective tasks while encouraging participants to apply feedback progressively throughout the course. This iterative process contributed to sustained professional growth and reinforced the integration of reflection within the broader learning design.

Structural and organisational components of the framework

The framework included organisational structures to ensure consistency, engagement, and accountability. Microsoft Teams channels centralised resources, assignments, and communication, while standardised assignment systems maintained coherence across courses. Clear expectations were set for participation, preparation, confidentiality, and professional interaction, including active engagement, independent work, pre-session preparation, and application of learning in practice. Within this integrated professional learning ecosystem, GenAI tools (Microsoft Copilot and ChatGPT) represented one component of the instructional design, supporting cognitive processing and reflection alongside trainer guidance, collaborative interaction, and digital learning platforms. Overall, these elements created an integrated professional learning ecosystem combining technology, structured pedagogy, communication, and reflection.

Alignment with experiential learning theory

The framework aligns with Kolb's (1984) experiential learning theory by organising learning into interconnected phases: pre-learning supports conceptual understanding, interactive sessions promote active experience and experimentation, and reflective activities encourage critical reflection and professional application. The integration of Microsoft Copilot and ChatGPT within this cycle reflects the use of GenAI as a cognitive and reflective scaffold that supports participants' engagement with experience and meaning-making processes. Integrated within a digitally supported flipped professional development environment, the framework also uses AI to enhance engagement and reflective practice. This model guided the design and implementation of the professional development courses examined in the study, as shown in Figure 1.

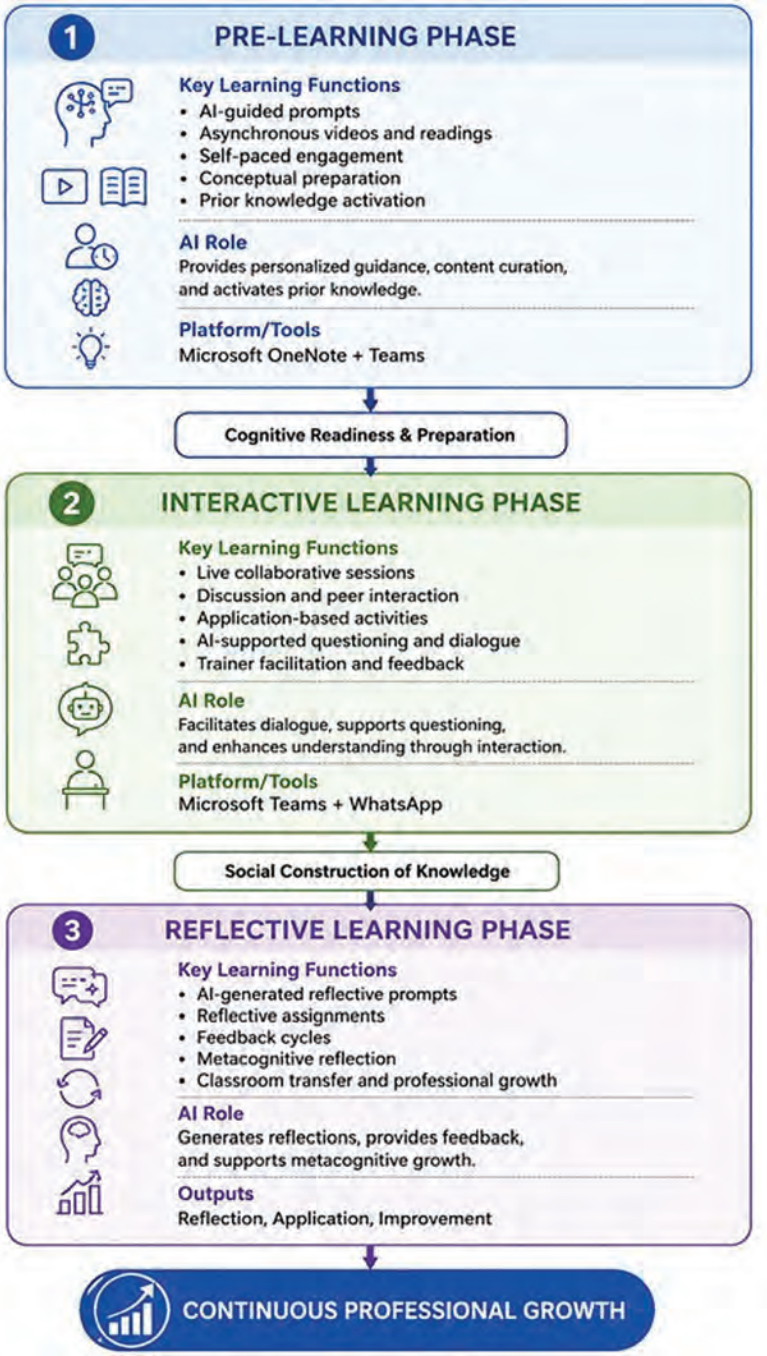


Figure 1. AI-supported flipped professional development process model.

METHODOLOGY

Research design

This study employed a qualitative case study design to examine the implementation of a generative AI (GenAI)-supported flipped professional development framework within a real-world educational context (Yin, 2018). The framework integrated Microsoft digital learning platforms, including Microsoft OneNote for organising learning resources, assignments, and asynchronous activities, and Microsoft Teams for synchronous sessions, communication, and collaborative engagement. The GenAI component involved the use of Microsoft Copilot and ChatGPT, which were incorporated as pedagogical scaffolds to support participants' cognitive engagement, questioning, reflection, and professional learning activities.

The framework was developed and coordinated centrally by the Education Resource Center (ERC), which ensured consistency in the selection of digital platforms, AI tools, learning activities, and implementation procedures across all professional development courses. All participants engaged with the same designated platforms and GenAI tools through trainer-guided activities and structured prompts. Therefore, AI use was embedded within a controlled professional development design rather than representing unrestricted individual use of different AI applications.

Descriptive quantitative data from participant questionnaires were incorporated to support and triangulate qualitative findings rather than for inferential analysis (Creswell & Plano Clark, 2018).

Participants

The study included 63 participants enrolled in five flipped professional development courses conducted between February and July 2025. Participants comprised 52 teachers, 6 coordinators, and 5 educational leaders drawn from seven schools affiliated with the host educational institution.

The flipped training programme was conceptualised and coordinated by two learning designers from the ERC, one of the operational units within the host educational institution. Five instructors also contributed to the design and facilitation of the training sessions. The instructional team included professionals occupying diverse educational roles, including subject coordinators, researchers, and school leaders (principal, vice principal, and head of cycle). Collectively, these contributors provided perspectives on both the design and implementation of the learning model.

Data collection

Data was collected from three primary, complementary sources. Participant questionnaires, consisting of five-point Likert-scale items ranging from 1 = strongly disagree to 5 = strongly agree, were administered via Microsoft Forms to capture participants' perceptions of engagement, interaction, and course effectiveness. Response frequencies and descriptive statistics were examined to summarise participants' perceptions and were used to complement and contextualise the qualitative findings. The questionnaire data were interpreted descriptively and were not used to establish causal relationships or measure learning gains. Trainer evaluation reports documented participant engagement, interaction patterns, and observable learning behaviors throughout course implementation, serving as continuous observational records of the learning process. Reflective assignments were evaluated using the ERC trainer-developed evaluation rubric. The rubric assessed four dimensions: understanding of material (40 percent), critical thinking and application of theory to practice (30 percent), clarity and organisation (20 percent), and timeliness (10 percent). Scores were used descriptively to examine engagement with reflective activities.

Semi-structured interviews were conducted with learning designers and instructors to explore design rationale, AI integration, instructional sequencing, and perceived effectiveness of the model, providing in-depth insights into decision-making and implementation experiences.

Data analysis

Qualitative data from interviews and trainer evaluation reports were analysed thematically using inductive coding to identify recurring patterns related to engagement, instructional design, and AI integration in the flipped professional development model. Questionnaire data were analysed descriptively using frequencies and means to support and contextualise the qualitative findings, without conducting hypothesis testing. Findings from all sources were then integrated through triangulation to compare and synthesise results, thereby enhancing the depth and credibility of the overall interpretation. Trustworthiness was strengthened through multiple strategies apart from methodological and data source triangulation. Peer debriefing with the instructional team helped refine interpretations and reduce potential researcher bias. In addition, descriptive quantitative data were integrated to complement qualitative findings and enhance convergence of evidence across data sources.

Ethical considerations

Prior to data collection, approval to conduct the study was obtained from the Director General of Education of the private educational association with which all participating school staff were affiliated. All participants were informed about the purpose of the study, participation was voluntary, informed consent was obtained from all participants, and all data were anonymised and treated confidentially throughout the research process.

FINDINGS

RQ1: Influence of AI-supported flipped design on teacher engagement

The findings indicate that the participants experienced positive levels of engagement across preparation, participation, interaction, and reflection. Participants reported high levels of overall satisfaction with the courses. Of the 63 participants, 28 participants (44.4 percent) rated the courses as excellent, while 35 participants (55.6 percent) rated them as very good. All 63 participants indicated that they would recommend the courses to others.

Engagement was especially evident during synchronous sessions. Participants described live discussions and collaborative activities as highly interactive and meaningful. Ratings of interaction with trainers were similarly positive, with 42 participants (66.7 percent) reporting excellent interaction and 21 participants (33.3 percent) reporting very good interaction. Trainer reports supported these findings and documented high levels of participation and motivation during live sessions. Because the study did not include a comparison group or pre-intervention data from previous professional development offerings without AI-supported components, changes in satisfaction or engagement attributable specifically to AI integration cannot be determined. The findings therefore represent participants' perceptions of the implemented AI-supported flipped professional development framework rather than evidence of causal improvement compared with previous models.

A major factor contributing to engagement was the effectiveness of the pre-learning phase. Participants entered live sessions with prior exposure to content, which increased confidence

and readiness for discussion. Trainers consistently observed that participants arrived with ideas already formed and demonstrated stronger willingness to participate. The flipped structure also supported learner autonomy. Participants appreciated the ability to review materials independently, engage at their own pace, and revisit content before live sessions. Communication systems further strengthened engagement. Trainers emphasised that WhatsApp groups and structured follow-up mechanisms maintained continuity and encouraged participation throughout the learning process.

Overall, the findings suggest that the integration of GenAI-supported activities within a flipped professional development structure contributed to a learning environment characterised by cognitive readiness, active participation, and sustained interaction. Participants' accounts indicate that AI-supported prompts and reflective activities complemented the existing affordances of flipped professional development by supporting preparation, engagement with content, and reflection. However, given the case study design, these findings do not establish that the AI-supported approach was more engaging than flipped professional development without AI integration.

RQ2: Perceptions of AI-supported learning activities

The second research question explored teachers' perceptions of AI-assisted learning activities across the phases of the flipped professional development model, organised into pre-learning, synchronous learning, and reflective learning.

Theme 1: GenAI-supported pre-learning phase (Preparation and cognitive readiness)

Participants expressed positive perceptions of GenAI-supported asynchronous learning activities, particularly regarding preparation and cognitive structuring. Survey data showed that 52 participants (83 percent) strongly agreed that asynchronous materials supported their learning effectively, while 11 participants (17 percent) agreed.

Participants reported that GenAI-supported prompts helped them focus on key concepts, think critically, and prepare better for live sessions. These perceptions suggest that GenAI-supported preparation was experienced by participants as a useful support for cognitive readiness and engagement during synchronous learning. For example, Participant 15 noted that the AI-supported activities helped them "think about the topic before coming to the session."

Theme 2: AI-enhanced synchronous learning phase (Engagement and interaction)

Synchronous sessions were perceived as highly engaging, with 52 participants (83 percent) strongly agreeing and 11 participants (17 percent) agreeing that live sessions were effective. Participants perceived that prior preparation through AI-supported activities contributed to their confidence during synchronous discussions and collaborative tasks. One participant described this experience: "I felt better prepared, participated more actively and confidently because of these activities" (Participant 35).

Trainer observations also indicated positive levels of participation, motivation, and interaction during synchronous sessions. However, because the study did not include a comparison group or previous implementation of the same courses without AI integration, these findings cannot determine whether GenAI-supported activities resulted in higher engagement compared with traditional or non-AI flipped professional development approaches.

Theme 3: AI-supported reflective learning phase (Metacognition and practice integration)

The reflective phase was identified as a strong component of the model. Participants reported that GenAI-supported reflection prompts encouraged deeper examination of practice and suported connections between theory and classroom application. As one participant explained: "The reflective prompts encouraged me to look at my teaching practices from a different perspective. They helped me connect the ideas that we discussed in the course with situations I experience in my own classroom" (Participant 60).

Trainer observations indicated sustained engagement with reflective activities. In one course, reflective assignments achieved an average score of 14.23/20. These assignments were evaluated using the ERC evaluation rubric, which assessed understanding of material (40 percent; 8 marks), critical thinking and connection between theory and practice (30 percent; 6 marks), clarity and organisation (20 percent; 4 marks), and timeliness (10 percent; 2 marks). The average score indicates that participants demonstrated satisfactory performance across these criteria, particularly in engaging with course materials and connecting concepts to professional practice. This score is reported descriptively as an indicator of assignment performance and engagement with reflective activities rather than as a measure of learning gains or the effectiveness of AI integration. Learning designers also noted that GenAI-supported prompts contributed to coherence across phases by maintaining a structured reflective process throughout the professional development cycle.

Given the absence of a comparative condition, these findings are interpreted as evidence of participants' experiences and perceptions of the implemented GenAI-supported framework rather than evidence that AI produced improvements over non-AI approaches.

Cross-phase challenges and implementation constraints

Despite overall positive perceptions, several challenges emerged, including internet connectivity issues, adjustment to self-directed learning, and varying levels of digital readiness. Participants also reported initial difficulties with platforms such as Microsoft OneNote and GenAI-supported tools. Suggested improvements included shorter videos, more interactive tasks, clearer instructions, and gamified activities.

Overall, teachers perceived AI as a facilitative tool that enhanced preparation, engagement, and reflection across all phases, while also introducing variability due to contextual and technical constraints. Notably, AI was viewed as augmenting rather than replacing instructional and human interaction in professional development.

DISCUSSION

This discussion interprets RQ1 and RQ2 findings across three phases of the AI-supported flipped professional development model: pre-learning, synchronous engagement, and reflective learning. Overall, findings suggest that participants experienced the GenAI-supported flipped professional development framework as a coherent learning design in which AI-mediated scaffolding was integrated across interconnected phases. The findings highlight how GenAI tools may support preparation, interaction, and reflection when intentionally embedded within a flipped professional development structure.

Engagement as a phase-dependent construct

Engagement is reconceptualised as distributed and phase-dependent rather than limited to visible participation in training sessions. Participants perceived GenAI-supported pre-learning activities as contributing to conceptual access, focus, and readiness before synchronous sessions. This aligns with research showing that generative AI can strengthen preparation and self-regulated learning (Kasneci et al., 2023; Miao & Holmes, 2023).

The findings contribute to discussions of engagement by illustrating how participants experienced engagement as distributed across phases, with pre-learning activities supporting preparation before synchronous interaction. This also aligns with Kolb's (1984) experiential learning cycle by showing that transitions from conceptualisation to experimentation are deliberately enabled through AI-mediated pre-learning scaffolds.

AI as embedded cognitive scaffolding in learning design

AI is reconceptualised as embedded cognitive scaffolding rather than an external instructional tool. Across phases, AI prompts guided attention, structured thinking, and supported deeper analysis. This aligns with research on generative AI as a cognitive and metacognitive support when integrated into pedagogy (Kasneci et al., 2023). The study contributes to this discussion by illustrating how GenAI-supported scaffolding can be embedded across multiple phases of a professional learning cycle rather than being limited to isolated feedback interactions. Theoretically, this aligns with Vygotsky's (1978) mediated learning, extended into digitally supported mediation distributed across different stages of the learning process.

Coherence as a mechanism of learning effectiveness

A key finding is that participants perceived coherence across phases as an important characteristic of the learning design. The pre-learning, synchronous, and reflective stages functioned as an integrated system, with each phase reinforcing the next. AI-supported prompts acted as continuity mechanisms that sustained conceptual threads across the learning cycle. This aligns with literature emphasising integrated digital learning ecosystems (Bond et al., 2020; Holmes et al., 2019). Coherence in this model is both structural and cognitive, supporting opportunities for iterative meaning-making and continued engagement across phases.

Reflection as a designed, not emergent, cognitive process

The findings highlight the value of intentionally designing reflection opportunities within professional learning experiences. Reflection was significantly strengthened through structured AI-supported prompts, enabling participants' reported analytical engagement. These findings are supported by research indicating that structured prompting enhances metacognitive depth (Kasneci et al., 2023) and that reflection is a designed cognitive process rather than an automatic outcome (Uittenhove et al., 2025). Within Kolb's cycle, reflection is reframed here as an intentionally engineered phase scaffolded by AI rather than a spontaneous stage.

Contextual constraints and design adaptation

Implementation was shaped by contextual constraints, including internet connectivity, digital readiness, and adaptation to self-directed learning. This aligns with literature emphasising that successful integration of GenAI-supported professional learning requires attention to socio-

technical readiness, infrastructure, and institutional capacity (Miao & Holmes, 2023; Williamson & Eynon, 2020). Thus, AI-supported flipped learning is best understood as a situated, adaptive design process rather than a universal solution.

Toward an integrated AI-supported flipped learning model

The findings suggest an integrated design framework in which AI functions as a phased cognitive scaffold across learning stages. The pre-learning phase supports conceptual preparation, the synchronous phase enables collaborative knowledge construction, and the reflective phase strengthens metacognitive synthesis through AI-supported prompts. The model's main contribution lies in integration rather than addition: AI is embedded as a learning design layer supporting continuity, coherence, and sustained engagement as perceived by participants.

CONCLUSION

This study demonstrates that AI-supported flipped professional development functions as an integrated learning system in which engagement, interaction, and reflection are distributed across interconnected professional learning stages. The findings indicate that participants perceived AI-supported pre-learning activities as supporting cognitive readiness, which was associated with positive experiences during synchronous engagement and reflective activities. Rather than operating as isolated instructional components, these phases formed a coherent learning continuum in which AI scaffolding supported continuity, progression, and depth of professional learning. The findings further suggest that the contribution of the framework lies in the intentional integration of GenAI-supported activities within a structured flipped professional development design.

The study contributes to AI-in-education research by framing AI as an embedded pedagogical scaffold supporting preparation, interaction, and reflection. It contributes to discussions of flipped learning and experiential learning by illustrating how GenAI-mediated support can be incorporated across different learning phases and strengthen cognitive progression. From a socio-constructivist perspective, it highlights AI's role in facilitating collaborative meaning-making and sustained engagement. The study provides contextual insights into the implementation of this framework within a resource-constrained educational setting.

The findings suggest that professional development programmes may consider integrating GenAI-supported activities across different stages of learning to support coherence, engagement, and reflection. The model is particularly relevant for contexts with limited time, facilitation capacity, and growing demands for flexible professional learning, where AI-supported scaffolding can enhance continuity and learner preparedness.

Limitations

The study is limited by its case study design and small sample size, which restrict generalisability. It relies primarily on self-reported perceptions and descriptive data, which may not fully capture behavioral change or instructional impact. In addition, it does not examine long-term effects or classroom-level transfer, limiting conclusions about sustained professional learning outcomes.

Although participants included teachers, coordinators, and educational leaders, the study did not conduct subgroup comparisons due to the exploratory nature and sample size. Furthermore, the

study did not include a comparison group or baseline data from previous professional development implementations without GenAI integration. Therefore, conclusions regarding the added value of GenAI compared with non-AI approaches remain limited.

Future research directions

Future research should explore longitudinal impacts of AI-supported flipped professional development on classroom practice, as well as comparative studies examining AI-supported and non-AI professional development models to determine whether GenAI integration contributes additional benefits beyond established flipped professional development approaches. It could also examine whether perceptions of GenAI-supported professional learning differ across professional roles. Experimental and quasi-experimental designs could provide stronger causal evidence, while further research is also needed on AI personalisation and its effects on instructional practice and student outcomes.

AI statement

AI tools were used to support language refinement, organisational structuring, and preliminary editing during manuscript preparation. All conceptual development, interpretation, and final writing decisions were completed by the authors.

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CAN GENERATIVE ARTIFICIAL INTELLIGENCE HELP SCALE INSTRUCTIONAL COACHING?

Jerrylynn Manuel

Little has changed since eLearning's last *Scope (Learning and Teaching)* publication in that we instructional designers are still on the journey of establishing ourselves within the Southern Institute of Technology (SIT) (Koller et al., 2023). Our role continues to evolve in response to the needs of individual projects and the organisation's current situation, a process consistent with the literature on this profession (Drysdale, 2019; Schwier & Wilson, 2010; Wintersberg & Pittich, 2025). The nature of our services can be best described as a mix of transactional (product focused, traditional instructional design) and transformational (pedagogical-change focused, learning design) work; the latter is the subject of this reflective piece. The terms instructional designer and learning designer are used synonymously at SIT.

eLearning became involved in facilitating pedagogical change across SIT because of the institution-wide roll out of hybrid-flexible (HyFlex) delivery. HyFlex is a delivery mode where learners decide on their method of participation: on-site, synchronously, or asynchronously. At the instructor level, due to the dynamic nature of the mode, this means rethinking how learning occurs. Instructional coaching has been our preferred method for implementing learning design choices made by the instructor. A detailed account of our instructional coaching service has been published elsewhere (Manuel & Watt, 2025). While the demand for the service has declined slightly this year, we anticipate a resurgence due to the need to offer more innovative learning experiences to ensure financial viability in this post-Te Pūkenga era. With our current level of staffing, it may not be possible or financially sustainable to offer the same degree of one-on-one assistance as what was previously supplied. Could generative artificial intelligence (GenAI) be our answer to increasing our reach in a cost-effective manner?

Given that instructional coaching is relatively new at SIT, if we are introducing GenAI, it is important to thoroughly evaluate the service for success and risk factors to avoid the ill-considered incorporation of this technology. Without the key insights provided by such a review, the benefits of human-led coaching may inadvertently be compromised for the sake of expansion. Thus, the purpose of this reflective piece is threefold: 1) to evaluate the key determinants of the service's success against the literature; 2) to synthesise research examining the relationship between AI and self-regulated learning, and 3) to propose a GenAI-augmented instructional coaching model. The hope is that the information presented here may benefit not only my own practice but that of other learning designers who are involved in institution-wide change.

INSTRUCTIONAL COACHING

A brief overview

Instructional coaching is a relationship-based system in which coaches engage with instructors to help them apply evidence-based teaching practices (Joyce & Showers, 2002). Ultimately, the goal of this interaction is to enhance teaching quality (Knight, 2017). It has often been described as more impactful than one-off workshops and other traditional forms of professional development (such as performance reviews) (Burleigh et al., 2023; Desimone & Pak, 2017; Knight, 2009). For years, instructional coaching has been characterised by cycles of observations and post-observation feedback (Joyce & Showers, 1981; Kretlow & Bartholomew, 2010). In Knight's (2009) earlier version of the instructional coaching process, a more detailed approach was provided with eight defining steps. The model was later condensed into three components (identify, learn, and improve) known collectively as the Impact Cycle (Knight, 2017). Key tasks associated with respective components include goal setting, coach-led training and modelling, and implementation and evaluation of the strategy. Central to Knight's models is the belief that instructors and coaches should engage in equal partnership for collaborative relationships to be established. Knight termed this the "partnership principle" and structured it around seven tenets (equality, choice, voice, dialogue, reflection, praxis, and reciprocity) (Knight, 2009; Knight, 2017). Therefore, reflective practice and collaborative relationships function as important drivers of deep learning around one's own teaching practice.

Effective coaching elements

When large-scale, project-driven pedagogical change is required, instructional coaching has proven to be an effective catalyst for it (Ako Aotearoa, 2025; Bennett, 2017; Bennett, 2019; Desimone & Pak, 2017; Knight, 2009; Kretlow & Bartholomew, 2010). In earlier work (Manuel & Watt, 2025), we established instructional coaching as an important mechanism for enhancing tutors' teaching abilities in the context of HyFlex delivery. Outside of that research, I have witnessed marked improvements in lesson planning, namely in the design of assessment-aligned instruction and tasks. This may be the result of frequent cycles of observation and feedback, and a manageable coaching workload maintained by limiting the number of instructors to support. Modelling (for instance, the sharing of exemplary digital content created by more experienced tutors) was generally underutilised by our coachees.

Compared to the findings of literature on instructional coaching, my observations suggest a much narrower range of effective coaching features. It should be recognised that the discourse on the efficacy of instructional coaching is largely dominated by research from within a certain segment of the compulsory sector in the United States (pre-K to elementary school, and reading and literacy initiatives). Critical coaching elements were found to vary across contexts. Coaching that is content specific, paired with instruction, and small in scale was claimed to enhance both teaching practices and student achievement (Kraft et al., 2018). Instruction and multiple cycles of observation and personalised feedback were described as essential by Kretlow and Bartholomew (2010). Glover et al.'s (2023) more recent work looked at the predictive power of individual coaching elements (modelling, practice, and feedback) on teachers' use of the evidence-based strategies, teaching fidelity, and student achievement. Their research revealed opportunities for practice to be a strong predictor of all outcomes. Feedback strongly predicted the first and third outcomes while modelling was found to be least effective (Glover et al., 2023). Finally, in the context of higher education, Burleigh et al. (2023) determined that the provision of high

quality, timely, regular feedback was essential for successful instructional coaching. Unlike the other studies, theirs focused solely on feedback. My observations are consistent with the studies above that highlight the importance of personalised feedback; however, more work is needed in my case to better determine the effectiveness of the individual components of eLearning's coaching system, especially their impact on student achievement.

The tutor factor

Instructional coaching has not always been welcomed by tutors. In fact, it is unclear within my setting whether its reception was positive or if participation was driven largely by compliance. Over the years, tutors have shown varying degrees of resistance. Those most defiant have often expressed discontent with their department's decisions to adopt HyFlex delivery. "Principled resistance" (the unwillingness to adopt mandated interventions) (Achinstein & Ogawa, 2006) was exhibited by these individuals in behaviours such as avoiding lesson observations and lack of engagement in scheduled coaching conversations or feedback implementation; and in attitudes including scepticism towards the degree of organisational support promised (such as time release for professional development). Workload issues have often been cited as a barrier to engagement, while teaching experience and subject area did not seem to be important factors. Often, it is those with an orientation towards the scholarship of teaching and learning who actively seek eLearning's services despite having similar work conditions as others. My speculation is that participation in instructional coaching may be heavily influenced by intrinsic motivation rather than external conditions.

One study by Jacobs et al. (2018) specifically explored why teachers chose not to engage in instructional coaching. Contrary to what I have observed, teaching experience and subject area were found to be important determinants of coaching participation. According to Jacobs et al. (2018), those more experienced (with more than 10 years of teaching experience) and from the science field were more resistant to coaching than their less experienced and social science and language arts counterparts. Similarly, the authors identified three categories of resistant teachers: 1) those resistant to coaching time (the time involved in communicating and engaging with their coaches), 2) those resistant to the initiative, and 3) those resistant to implementing feedback. Aside from competing demands with teaching duties, little explanation was offered for why teachers devoted little time to coaching. Jacobs et al. (2018) go on to state that resistance to the initiative and to coaching may be mutually exclusive issues and that they should be dealt with separately; I have tended to believe that the former is the cause of the latter. It is also worth noting that there was no difference in the overall quality of teaching between the resistant and receptive groups in Jacobs et al.'s study. This led the authors to question the extent of coaching required by all participants and suggest that alternative supports be made available. As the majority of the participants were experienced teachers, the authors suggest that resistance may be due to their lack of interest in changing their methods. I have made a similar observation with our cohort of coachees, as some were able to apply best practices with minimal to no assistance from eLearning. What this all suggests is that the experiences described within SIT are unremarkable. Something I have not considered is whether non-participants are involved in peer support and knowledge sharing elsewhere. This is something that I will look into in the future. Perhaps, AI could serve as a useful tool to enhance coaching by acting as an alternative to the coach.

THE RELATIONSHIP BETWEEN AI AND SELF-REGULATED LEARNING

As recognised above, cycles of observation and feedback are a valued part of eLearning's instructional coaching model. Rather than as a means of one-way transmission of my criticism, these cycles function as opportunities for scheduled, guided reflection by the coachee. However, for instructors to reap the benefits of it they must be willing to engage. In the remaining part of this piece, I will describe how AI may be leveraged to expand support options for participants while preserving the effectiveness of key coaching elements.

The provision of personalised feedback and an individual's intrinsic motivation are both reflected in the theoretical concepts of self-regulated learning (SRL), personalised learning, and self-determination theory. According to self-regulated learning theory, students are active participants in their education through the setting of goals (forethought phase), the act of learning and monitoring their progress (performance phase), and the evaluation of their performance (self-reflection phase) (Zimmerman & Moylan, 2009). Personalised learning refers to an individualised learning experience where the instructor uses educational theory, their expertise, and learner data to adjust instruction to better meet the needs of their learners (Shemshack & Spector, 2020; Walkington & Bernacki, 2020). Self-determination theory asserts that when students' autonomy, competence, and relatedness needs are met, intrinsic motivation is enhanced (Ryan and Deci, 2020). According to Lan and Zhou (2025), self-determination theory may be situated within the forethought phase of SRL.

In my view, there exist parallels between Knight's Impact Cycle and SRL; the first two and the final stages of the Impact Cycle may be categorised within the forethought, and performance and self-reflection phases, respectively. What is more, Knight's model may be used to operationalise SRL by guiding instructors through the process of goal setting, performance monitoring, and self-refection. Several studies have explored the relationship between AI and SRL (Achuthan, 2025; Fan et al., 2025; Lan & Zhou, 2025; Li et al., 2026; Sharma et al., 2025; Q. Xu et al., 2025; X. Xu et al., 2025; Zhai et al., 2024). With SRL being the common link between instructional coaching and AI, I am suggesting that the literature on SRL may be used to guide AI adoption in an instructional coaching context. The impact of AI on SRL and a proposed AI-augmented instructional coaching model are described below.

The facilitative role of AI in self-regulated learning

While there is limited information on the role of AI in supporting self-regulated learning in higher education, several reviews have sought to clarify the relationship between the two. Lan and Zhou's (2025) qualitative systematic review determined that all AI tools studied had some effect on the different stages of SRL and that the impact appeared to be tool specific. For instance, due to their ability to provide real-time guidance, chatbots were found to support the performance stage. Moreover, seven out of the 14 studies included in the review focussed mainly on performance support. In Achuthan's (2025) systematic meta-analysis, AI interventions (such as the use of conversational and interactive systems like ChatGPT) yielded strong, positive effects on all SRL stages. Compared to the other stages, the positive effect on forethought was most pronounced while a small but statistically significant positive effect was noted for self-reflection. The effect on performance was found to be dependent on context. In studies related to personalised learning, the AI-SRL relationship is more implied. For instance, in Sharma et al.'s (2025) systematic review, affordances associated with the use of large language models in learning (for example, immediate guidance, emotional and motivational support, and in some cases enhanced critical

thinking skills) appear to align within the three stages of SRL. In terms of the association of AI-driven personalised feedback and students' goal achievement, self-efficacy, and engagement, Q. Xu et al. (2025) reported a moderate to strong effect on each. When mapping to SRL, goal achievement and self-efficacy may be associated with forethought and engagement to perform. In a self-directed professional development context, GenAI was reported to have helped reduce the inertia of starting tasks such as course design, and to have enhanced the reflective practice of teachers (Li et al., 2026). Taken together, the data suggests the following associations: GenAI-forethought and GenAI-self-reflection. Overall, the reported positive effect on forethought was consistent across most of the studies evaluated.

The negative effects of AI on self-regulated learning

Despite the reported benefits described above, several studies have drawn attention to the adverse and limiting effects of AI on SRL (Achuthan, 2025; Fan et al., 2025; X. Xu et al., 2025; Zhai et al., 2024). In Zhai et al.'s (2024) systematic review of the impact of AI dialogue systems on students' learning in higher education, the authors surveyed concerns around the potential decline of students' cognitive abilities especially in the decision-making, critical thinking, and analytical thinking domains. They also raise ethical issues around AI, including hallucinations, algorithmic bias, plagiarism, and privacy and transparency concerns. Rather than merely accepting AI-generated outputs at face value, the authors suggest that students approach them with a critical lens, and that the inherent flaws of AI outputs be addressed. In a similar vein, Fan et al. (2025) highlighted the risk of "metacognitive laziness" where learners offload metacognitive activities (such as orientation, planning, monitoring, and evaluation) associated with SRL to AI. In their study, those who used ChatGPT support for revision of their written assessments exhibited fewer metacognitive processes compared to those who utilised other avenues of support (for instance, human experts). Fan et al. (2025) concluded by proposing scaffolds to support active learning. X. Xu et al. (2025) found that the provision of metacognitive support to college students in GenAI learning environments enhanced their SRL abilities, particularly in task strategy, help seeking, and evaluation dimensions; those without support saw a reduction in those same areas. The authors assert that this type of support may help students become more discerning with and less reliant on AI outputs. Finally, Achuthan (2025) concluded that the benefits of AI use on SRL are not universally applicable with participant age, and length and area of study being moderating factors.

AI-AUGMENTED INSTRUCTIONAL COACHING

What all this may mean for GenAI- augmented instructional coaching is that the application of AI should be restricted to certain parts of the coaching process and individuals, and that human involvement is needed to ensure deep learning still occurs. Models have begun to emerge that describe collaborative and supportive roles of AI in the instructor-AI relationship (Guberina & Procházka, 2026; Memon & Kwan, 2025). For instance, Memon and Kwan (2025) propose a dynamic interaction where GenAI may be used to assist students pre- and post-lesson, and teachers with lesson design. In Guberina and Procházka's (2026) co-teacher model, the teacher's authority over information and decision-making abilities are retained while AI fulfills a distinct function in the system, such as the provision of feedback based on a rubric or set of criteria supplied by the teacher. Even when adhering strictly to these authors' suggestions that GenAI remain as a collaborative partner, any proposed instructional coaching model has the potential to offer instructors (coachees) a more personalised coaching experience by widening the range of support options. The willingness by both parties (instructor and coach) to engage with GenAI

in this context is a limiting factor. Additionally, by shifting the facilitation of tasks associated with those earlier in the instructional coaching process (such as goal setting) to GenAI, there is a risk of limiting the time to cultivate instructor-coach relationships. Therefore, integration of AI must be carefully considered so as not to diminish opportunities for human partnerships to develop.

Although the integration of GenAI into instructional coaching at SIT is still far from reality, in preparation for the inevitable, a conceptualised model has been proposed (Figure 1) that draws on insights from the literature on AI and self-regulated learning.

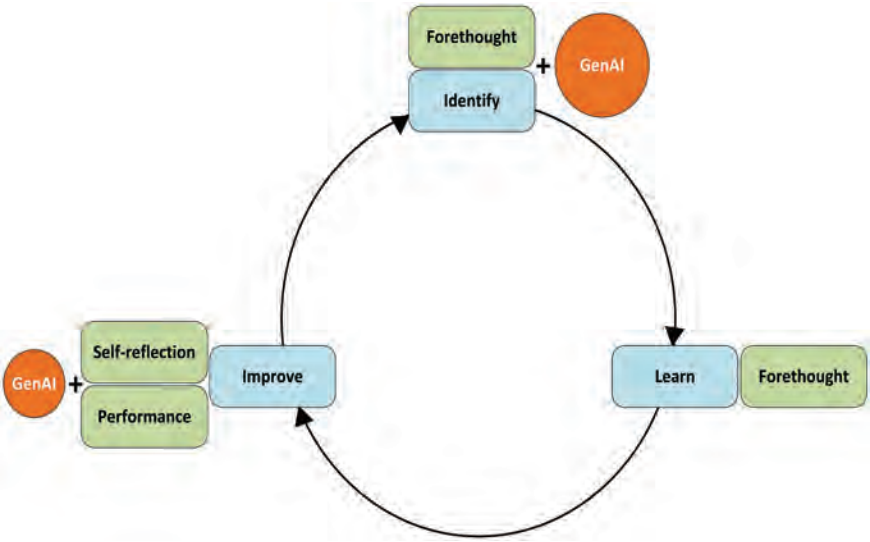


Figure 1. GenAI-supported Instructional Coaching Model. Created by the author depicting the alignment of Knight's Impact Cycle (in blue) and the self-regulatory process (in green), and the corresponding parts of the cycle that may be augmented by GenAI (in orange).

What is envisioned is that GenAI may largely support the "identify" and "forethought" phases of Knight's Impact Cycle and the SRL process, respectively. Additionally, it may serve a lesser function in the "improve" section of Knight's process. The rationale for limiting AI use in the latter part of the instructional coaching process is to help ensure that deep learning of coachees occurs through coach-led strategies, such as the provision of metacognitive support.

FINAL THOUGHTS

Overall, though some remain sceptical of its utility, instructional coaching has been useful in my setting to improve the teaching practices of those involved in HyFlex delivery. While the service is now in its fourth year, it has yet to be thoroughly evaluated. This being the case, integrating GenAI into instructional coaching at SIT is a task for the future, but the model presented here offers one possible path. To answer the question posed at the beginning of this piece: Yes, GenAI may help scale eLearning's instructional coaching service, but only incrementally, as the intention is not to replace the coach, but to use AI to help redirect the coach's efforts to the parts of the coaching process where human involvement is most valued.

Jerrylynn Manuel is an instructional designer at the Southern Institute of Technology where she supports instructors with the application of digitally enhanced teaching practices and the creation of digital learning resources. Her areas of interest include flexible and distance education, the instructor experience, and instructional coaching.

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