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Lessons to Guide AI Integration Efforts: An Illustrative Narrative of a Teacher Educator in New Zealand

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Abstract- Advances in technology have created the potential for a new era of learning that is both ubiquitous and authentically grounded in real-world contexts. However, there remains a gap between this theoretical potential and the lived experiences of teacher educators (TEs). To help bridge this gap, this study explored a TE's lived experience. The study used a narrative inquiry approach to examine how the TE integrated technology into teaching and learning, offering insights into a range of pedagogical strategies. The narrative illustrates how the TE designed and implemented a range of pedagogical approaches that modelled effective technology integration, giving student teachers (STs) authentic opportunities to engage in technology-mediated learning aligned with the TPACK framework. Lessons learned, which emphasise the need for ongoing professional development that strengthens both technical competencies and technology-enhanced pedagogical approaches, offer valuable insights into the integration of artificial intelligence in teacher education, a process that is still in its early stages.

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Carolyn Nekesa Obonyo

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I. INTRODUCTION

Digital technologies have theoretically expanded the horizons for ubiquitous, collaborative, authentic, and innovative learning environments. The extent to which this potential is translated into substantive practice rests upon the pedagogical agency of teacher educators (TEs) (Cochrane, 2014). Nonetheless, a gap remains between this theoretical potential and the lived experiences of TEs. The recurring dissonance observed during technological transitions suggests that difficulties in embedding emerging tools are not merely technical. Still, they reflect a systemic failure to align institutional support with the evolving demands of technology integration. The pedagogical landscape of teacher education has undergone iterative transformation with the rapid evolution of digital tools, spanning from early computer-assisted instruction to the widespread adoption of Learning Management Systems (LMS) to support ubiquitous learning. The technological

trajectory to Web 2.0 introduced affordances such as collaborative learning (Cochrane, 2014) with tools ranging from Virtual Learning Environments, e-portfolios, interactive whiteboards, and social media for professional learning networks. TPACK (Technological Pedagogical Content Knowledge) has become a core framework for researching how educators develop the skills to use technology in their practices (Mishra & Koehler, 2006). The emergence of AI-driven educational technologies, such as educational simulations (e.g., Lee & Kim, 2025), learning analytics, adaptive learning technologies, and intelligent tutoring systems, has brought profound and far-reaching systemic complexities that are reshaping the educational landscape (Crompton & Burke, 2022). However, it simultaneously offers a transformative opportunity to architect highly individualised and interactive learning environments.

Despite the evolution of digital tools, substantive pedagogical transformation is frequently stalled by a combination of systemic and individual challenges. These challenges create a widening gap between the availability of technological tools and their authentic application in practice. Externally, TEs contend with first-order barriers (Ertmer, 1999), including infrastructure deficits, inadequate technical support, and institutional policy frameworks that fail to keep pace with technological acceleration. More critically, these external pressures are compounded by internal, second-order barriers. Limited digital fluency, the persistence of traditional teaching philosophies, and the pedagogical inertia of educators continue to impede progress (Ertmer, 1999). Addressing these second-order barriers requires more than technical training; it necessitates a double-loop learning approach that encourages TEs to interrogate the foundational beliefs that underpin their resistance to technology adoption.

These are not new challenges; they have persistently plagued successive generations of technology. Their recurrence in current artificial intelligence (AI) adoption efforts reveals limitations in how educational institutions conceptualise and support digital transformation. These systemic barriers exert a profound impact on ITE by undermining the development of digital fluency. In the absence of robust pedagogical modelling of technology-enhanced instruction, including the ethical integration of AI, STs are deprived of the opportunity to

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develop a critical pedagogical stance. This creates a crucial gap in the workforce, as new teachers enter the profession theoretically aware but practically ill-equipped for the socio-technical demands of 21st-century schooling.

While challenges persist, many TEs have demonstrated significant pedagogical resilience in embedding digital tools within their practices. This research explored the pedagogical repertoire employed by TEs to cultivate the digital fluency of STs, ensuring their professional readiness for classrooms increasingly defined by rapid technological evolution (Obonyo, 2020). In this paper, the focus is narrowed from the larger research question: "What pedagogical strategies do TEs employ to support the teaching and learning of STs? An illustrative narrative of a TE provides lived experiences of how she navigated the challenges and integrated technology in her practices. These instances of effective practice provide a vital evidence base from which to draw as the sector confronts the complexities of AI.

II. LITERATURE REVIEW

a) *The Pedagogical Affordances of Artificial Intelligence*

This section explores the application of AI in educational contexts, with a focus on AI's pedagogical affordances in K–12 settings, the context in which STs are being prepared. Crompton et al. (2024) identified a wider range of pedagogical affordances than has been observed in higher education research. This can be attributed to the "pedagogical knowledge and training received in becoming a K-12 teacher" (p. 256). The section aims to provide insight, given evidence that teachers have a limited understanding of AI and its pedagogical applications, highlighting the continued need for further qualitative research (Crompton et al., 2024). AI has been conceptualised in multiple ways across the literature. For this paper, the definition adopted is that AI is "computing system that are able to engage in human-like processes such as learning, adapting, synthesising, self-correction and the use of data for complex processing tasks" (Popenici & Kerr, 2017, p. 2).

The literature indicates that using AI provides opportunities to support teaching and learning. Although AI was not designed for any specific subject domain, most empirical studies have focused on its use in mathematics, science, and language learning, with high school and elementary settings receiving the most sustained research attention (Crompton et al., 2024). Furthermore, teachers are the largest group of AI users (Diliberti et al., 2025). A systematic review of 204 articles across 2000-2020 focused on the use of AI in K-12 settings (Crompton & Burke, 2022). Findings show that teachers in schools mainly use AI for monitoring students, managing groups, automating grading, and supporting decision-making. Research shows how AI enables

teachers to monitor student activity in the classroom and identify those who need support in a less physically intrusive way. In terms of group management, studies indicate that AI supports teachers with group formation, moderation, and facilitation.

Although grading remains a labour-intensive aspect of teaching, teachers are beginning to leverage AI to analyse student work and generate real-time feedback. Research demonstrates AI's affordances in efficiently processing extensive datasets and synthesising information from multiple digital platforms, enabling more timely and informed data-driven decisions (Crompton & Burke, 2022). Teachers are also using AI to predict student academic performance, and this aligns with findings showing that they integrate AI into activities grounded in specific pedagogical approaches, including active learning, personalised learning, gaming, modelling, and collaboration (Crompton et al., 2024).

While AI tools offer considerable pedagogical affordances, their integration into educational practice has also posed substantial challenges. Studies have reported that teachers have negative views of AI, ethical concerns, ease of use, hardware and software challenges, algorithmic biases and many institutions lack clear policies (Crompton et al., 2024; Popenici & Kerr, 2017). Diliberti et al. (2025) found that many K-12 public school districts have provided teachers' training on the use of AI in schools by addressing teachers' concerns, confusion, and fears about the technology. However, Crompton et al. (2024) found a need for more professional development to reduce some of these challenges. These challenges threaten to deepen existing inequities and place additional pressure on teachers to model pedagogically sound and responsible uses of AI.

b) *Integrating Technology into ITE Programmes*

Integrating technology into ITE programmes requires leveraging TEs' readiness and continuous professional development. Mishra and Koehler (2006) noted the integration of technology into teacher education is enhanced when TEs understand how knowledge of technology, pedagogy, and content is interrelated and how they align with one another. According to TPACK, successful technology integration is achieved when the use of technology works well with the pedagogy and content to facilitate new pedagogical ways of teaching. Noting the need for AI integration frameworks, Crompton et al. (2024) suggest that TPACK can be used to support educators' understanding of how AI can be implemented in teaching and learning. On the contrary, Farjon et al. (2019) noted that the TPACK framework has been criticised for not being useful to determine effective technology integration, while Admiraal et al. (2017, p. 116) argued that although TPACK models knowledge that must be acquired, it

“does not say much about how this integrated knowledge should be acquired.”

However, the literature is consistent in finding that when technology is treated as an isolated component, STs feel unprepared to use it in their future classrooms (Tondeur et al., 2020). Conversely, several researchers (e.g., Lee & Kim, 2025) have highlighted that integrating technology throughout coursework, assessment practices, and field experiences enables STs to manage technology-enhanced learning environments effectively. In their studies, STs engaged with technology through design-based learning and collaborative inquiry. This enabled them to practise metacognitive reflection, resulting in an expanded pedagogical repertoire and a more integrated understanding of TPACK. The issue is no longer whether ITE programmes should integrate technology, but rather how they can do so in ways that are pedagogically robust, contextually appropriate, and sustainable over time (e.g., Baran et al., 2019).

Preparing STs to integrate technology adequately into their practices is a complex and challenging process for TEs (Tondeur et al., 2019). It requires good access to software, hardware, and support, both during coursework and teaching practice. TEs are expected to be proficient in the use of technology and to have positive attitudes towards technology (Tondeur et al., 2019). While some appear unwilling to integrate technology into their courses, they encounter difficulties associated with a lack of quality training and limited or no pedagogical training to meet the educational needs of 21st-century classrooms (Baran et al., 2019). The main challenge TEs experience is the time it takes to develop STs' technological pedagogical design capabilities (Tondeur et al., 2020).

c) Pedagogical Strategies used to Prepare STs for Technology Integration

This section explores what TEs do in the classrooms to prepare STs to integrate technology in their practices. TEs are expected to implement a range of innovative strategies that allow STs to experience, enact, and critically evaluate technology-enhanced learning. Such strategies support STs to connect their knowledge of technology, pedagogy, and content (Tondeur et al., 2020). This in turn, enables STs to “effectively teach with technology in PK-12 classrooms” (Foulger et al., 2017, p. 419). The literature reveals several interrelated pedagogical strategies that effectively prepare STs for technology integration and transfer to school contexts. Some of these strategies include modelling technology-rich pedagogy, authentic learning opportunities, active learning, collaborative learning, providing formative assessment, and personalised learning (Akçayır & Akçayır, 2018; Foulger et al., 2017; Tondeur et al., 2020).

Modelling technology-rich pedagogies aligned with content areas exposes STs to authentic illustrations of digital practice and provides opportunities to engage

in the corresponding instructional activities (Foulger et al., 2017). TEs can provide STs with exemplars of the educational affordances of specific technology and support STs to use technology to search for information, learn independently, and acquire higher-order thinking skills (Baran et al., 2019). Research shows that modelling technology-rich pedagogy shaped STs' self-efficacy and their intentions to integrate technology (Kukul, 2023), motivated them to integrate technology into their subject teaching (Admiraal et al., 2017), and lowered second-order barriers in them (Tondeur et al., 2020). These findings suggest that when TEs demonstrate effective digital pedagogy, STs become confident in using technology, enhancing their ability to transfer knowledge into practical application (Obonyo & Thomas, 2025).

Authentic learning facilitates meaningful technology integration. It occurs when STs engage in situated, contextualised tasks that involve applying discipline-specific tools, fostering active participation and discursive processes that mirror real-world contexts (Tondeur et al., 2020). Obonyo (2020) found that TEs integrated mobile technologies into their practices to enhance STs' learning of a variety of real-world tasks that applied to school contexts, guided them to use mobile technologies as learning tools in authentic contexts and facilitated learning that was seamlessly integrated with authentic assessments. Authentic learning aligns seamlessly with the flipped classroom model, which also incorporates collaborative learning. The asynchronous delivery of content optimises the in-person space for higher-order, experiential activities that mirror real-world professional practice (Akçayır & Akçayır, 2018).

Another pedagogical strategy is the flipped classroom, in which students learn new content before class, typically through online resources. Class time is then used for deeper engagement, including discussion, collaborative group work, problem-solving, and feedback (Akçayır & Akçayır, 2018). Flipped learning environments enable TEs to design student-centred, technology-enhanced learning experiences. These environments provide opportunities for STs to engage with digital content, learn to express themselves in multimodal ways, manage online learning spaces, and reflect on how such approaches translate into school contexts (Akçayır & Akçayır, 2018; Ferdig & Kennedy, 2014). With rising expectations for online education, STs are now expected to teach in an environment that differs markedly from traditional classrooms. The flipped classroom supports active learning and pedagogical reasoning about technology integration. However, research consistently identifies the substantial time commitment and increased workload associated with pre-recording video lectures and preparing other learning resources as the primary challenges of this model (Akçayır & Akçayır, 2018).

Personalised learning is achieved by using technology to intentionally tailor learning, differentiate instruction and enable students to work at a pace that

suits their needs. Literature indicates that by personalising learning for STs, TEs give them first-hand experience of learner-centred design. This experience deepens their understanding of how technology can support differentiated, flexible approaches, thereby enhancing their readiness for technology integration (Ferdig & Kennedy, 2014). Although preparing STs for technology integration requires a multifaceted pedagogical approach, Tondeur et al. (2020) found that most studies focus on individual strategies. Exploring how multiple strategies work together would deepen insight into the preparation of STs for technology integration.

III. METHODOLOGY

This study employs a narrative inquiry methodology to explore a teacher educator's lived experience of integrating mobile technologies and the implications of this experience for effective AI adoption in teacher education. Narrative inquiry is grounded in the view that human experience is storied and that understanding experience requires attention to temporality, sociality, and place (Clandinin & Connelly, 2000). Narrative inquiry is well-suited to educational research puzzles that seek to generate richly contextualised accounts of participants' lived experiences and to interpret how they make meaning through the stories they tell (Wei, 2023), enabling a nuanced understanding of how educators interpret and respond to technological changes.

a) *Research Design*

The research design is structured around the three interrelated dimensions of narrative inquiry: temporality, sociality, and place (Clandinin & Connelly, 2000). These dimensions provide a systematic framework for capturing the richness of lived experience over time, the personal and social conditions shaping that experience, and the specific contexts in which it occurs (Wei, 2023). *Temporality* attends to how past experiences with technology shape present practices and future orientations. *Sociality* considers the personal and professional factors that influence the educator's decisions, including identity, values and beliefs, institutional expectations, and relationships with colleagues and students. *Place* recognises that experiences are situated within specific physical, organisational, and digital environments, such as teacher education programmes, policy contexts, and online learning platforms (Clandinin & Connelly, 2000). Together, these dimensions ensure that the narrative is analysed not simply as a personal story but as an experience embedded within broader educational, institutional, and technological contexts.

b) *Participants*

Participants were selected through purposive sampling. The work presented in this paper is based on

a doctoral study (Obonyo, 2020) that explored a research puzzle of how eight TEs used mobile technologies to influence the teaching and learning experiences of STs. Semi-structured interviews were conducted with the TEs to gather their insights on the pedagogical strategies that they used to prepare STs to integrate mobile technologies into their future classrooms. This paper provides an illustrative narrative of one TE who supported approximately 50 STs, enrolled in a programme that had two modes of study, on-campus and a blend of distance and F2F learning. Ffion's (pseudonym) narrative is about how she used different innovative pedagogical practices and integrated cloud-based technologies into her teaching. When she participated in this study, Ffion had fifteen years of teaching experience at ITE and had actively incorporated technology into her practices, allowing for reflection across temporal dimensions.

c) *Field Texts Generation*

The contribution of narrative inquirers arises from the inquiries they pursue, their situated presence as observers within the research context, and their interpretive elaboration of participants' narratives (Wei, 2023). Field texts of this research were generated through multiple sources. A semi-structured narrative interview was used to elicit views and opinions from the TE. To ensure credibility and richness of the texts, additional field texts included both online and F2F classroom observations through non-participant observation and a reflective journal that captured the researcher's thoughts, reflections, and feelings throughout the research journey. The researcher engaged in ongoing reflexive practice to acknowledge positionality as both narrator and analyst. Narrative inquiry recognises reflective writing as a legitimate and rich data source because it captures the complexity, emotion, and situated nature of professional experience (Lim et al., 2022). The iterative nature of the writing process allowed the researcher to revisit and reinterpret key moments, deepening the analytical insight.

d) *Transitioning Field Texts*

Field texts were transitioned to research texts using three analytical tools: broadening, burrowing, and storying/restorying (Clandinin & Connelly, 2000). I began by familiarising myself with the text by reading and re-reading while noting down initial ideas. The process followed iterative cycles of coding, narrative reconstruction, and reflexive memoing to provide a nuanced understanding of how TEs make sense of their professional experiences. Themes were related to pedagogical reasoning and technology integration and were used as narrative threads that illuminated recurring patterns within Ffion's story, while the story remained the primary unit of analysis and representation. Since narrative is viewed as a whole, it does not require theming or categorisation; rather, threads are discussed within narratives (Clandinin & Connelly, 2000). To ensure

credibility and trustworthiness of the reconstruction and interpretation, the researcher consulted Ffion as part of the member-checking process. Ethical research approval was obtained from the university before conducting the study. Before presenting the illustrative narrative, the following is a brief description of the setting in which Ffion's lived experiences unfolded.

e) *Setting*

This section begins by setting the scene in New Zealand ITE to inform an understanding of the context in which Ffion was working and how she was responding to both their national and institutional contexts. ITE aims to equip STs with the knowledge, skills, and competencies needed to teach in diverse educational settings (Obonyo, 2020). In New Zealand, the focus is on meeting the diverse needs of learners by integrating coursework with practical teaching experience, emphasising culturally inclusive and contextually relevant practices and technological proficiency (Everatt et al., 2023; Fletcher & Everatt, 2021). The Teaching Council regulate all providers of ITE and must prove how their programmes enable graduates to meet the standards for the teaching profession (Education Council, 2017).

National education priorities, such as integrating technology and fostering culturally responsive teaching, have influenced the evolution of ITE practices. For example, during the period of this study, schoolteachers were being guided by the curriculum, which outlined digital technologies as a key learning area to prepare all students to be technologically literate. Given such national priorities for schools, ITE is entrusted to enable STs to develop curriculum and learning experiences aligned with the digital technologies outcomes. Another priority was to prepare culturally responsive STs to increase their effectiveness in supporting learners from diverse backgrounds, particularly Māori, Asian and Pasifika learners, students for whom English is an extra language, and those from low socioeconomic households. It was expected that STs would be assessed throughout the programme on their competence in te reo Māori, culminating in a final evaluation of their ability to pronounce te reo Māori words accurately and to use the language appropriately in teaching contexts. (Education Council, 2017). This description contextualises the ITE department within some national initiatives in the education system that influenced practices in teacher preparation during the time of this study.

The following section presents Ffion's lived experience as it unfolded over time with thematic insights woven through the narrative, shaping a nuanced understanding of how technology is experienced in practice and offering a grounded foundation for interpreting the implications of integrating AI in teacher preparation.

IV. FFION'S ILLUSTRATIVE NARRATIVE

Narrative inquiry assumes that people make sense of their professional lives through stories, and that these stories unfold across time, shaped by relationships, contexts, and shifting identities. For this reason, the findings are presented as a series of narrative episodes that reflect Ffion's experience as it was lived, rather than as decontextualised fragments. Ffion's story offers insight about how she navigated change, uncertainty, and innovation.

With fifteen years of teaching experience, Ffion had created, coordinated and taught several courses in the ITE department. She entered the profession with a strong commitment to student-centred learning and a belief that teaching should be relational, dialogic, and grounded in care. Technology was not initially central to her practice; national education priorities and institutional changes shaped early experiences with digital tools. As a team leader of TEs, they were expected to blend distance learning and face-to-face (F2F) learning, a shift from traditional F2F teaching. These study options were enhanced by educational technology, which increased access, collaboration, and the flexibility of learning, and STs could choose an option that suited them. Furthermore, she worked closely with other TEs to redesign the curriculum into blended courses and to coordinate the improvement of the blended courses, especially the Māori language course across all the ITE programmes within the institution.

Ffion's relationship with technology evolved. She navigated the complex environment gradually, first by learning how to facilitate flipped learning, then distance learning, a decision that was shaped by the institution, and then with multimedia resources to support diverse students' needs. Facilitating a blend of distance and F2F learning marked a turning point, forcing Ffion to reimagine teaching in ways that foregrounded connection, clarity, and flexibility. This period reshaped Ffion's pedagogical identity, deepening a commitment to inclusive design and prompting a more intentional engagement with digital tools. When asked how she would rate her use of mobile technologies to support teaching and learning, Ffion identified their maturity at the highest level: Stage 6 (*Creative application to new contexts*), based on Knezek et al.'s (2000) Stages of Adoption of Technology Scale. This level represented integrating mobile technologies into the curriculum and in the classroom as instructional tools.

The following narrative episodes trace key moments in Ffion's journey, illustrating how technology became woven into the fabric of teaching practice and how these experiences illuminate possibilities and limitations for the emerging use of AI in teacher preparation.

Narrative Episode 1: Technology as a Tool for Supporting Authentic Learning Experiences

Ffion used technology with a clear instructional purpose that was focused on learning outcomes. She integrated technology into her teaching in creative ways to support skills such as creative thinking, analytical reasoning and collaboration. She said, "It wasn't about gaining knowledge but actually giving them skills [to use technology] as well." Indeed, she played a key role in responding to the increasing demands of transformational changes centred on teaching in the 21st century, which can disrupt TEs' beliefs about teaching and learning. What distinguished Ffion from other TEs was that she mastered a range of digital tools and mobile apps and understood how they could be deployed for a variety of pedagogical strategies, such as authentic learning, reflective practice, collaboration, and flipped classroom. Ffion was involved in selecting appropriate tools for the specific tasks with the STs, so that they could learn how to use technology by design. She encouraged STs to use Quizlet to create interactive quizzes for each other, because "that's my preferred one, it's easier for students [STs], particularly for te reo Māori, when they are learning new concepts, they will make quizzes for each other about the concepts we are doing." This task situated STs' learning within realistic teaching scenarios and reflected the authentic practices of the profession, prompting them to integrate pedagogical, technological, and content knowledge in a contextualised manner (Tondeur et al., 2020).

When I observed Ffion's online practice, I realised that some of the learning tasks she designed were complex in ways that supported creative thinking, collaborative reflection and problem-solving. The tasks enabled STs to actively construct their own knowledge through exploration (Lee & Kim, 2025). For example, Ffion uploaded a short video clip to the LMS for STs to watch at their own time and place before the session. The video illustrated a storytelling technique they could use with their future students. Ffion appeared to support STs in internalising key pedagogical principles they would later be expected to enact in school settings. While watching the video, STs were expected to reflect on four questions, which they would discuss during their class session. Sharing the video content allowed her to circumvent the temporal and logistical constraints of traditional methods, redirecting cognitive effort towards higher-order analysis (Akçayır & Akçayır, 2018). One of the questions asked how STs would offer opportunities for students to tell their stories, thus connecting theoretical understanding and practical applications, a challenge that persists in teacher preparation (Lee & Kim, 2025; Obonyo & Thomas, 2025). This task demonstrates how STs can engage in reflective practice to develop metacognitive awareness of their technology use. The unique affordances of mobile technologies provided STs

with diverse modalities of engagement, effectively facilitating pedagogical efficiency.

One moment that stood out in Ffion's memory was the learning support that STs offered one another as they launched further into inquiry. "It was good to use Padlet because some students [STs] were struggling to know how to use Padlets to complete their assignments, and other students [STs] helped them. So that was great." She reflected. This illuminates the transformative potential of peer relationships and purposeful scaffolding through social interactions with more knowledgeable others in fostering knowledge construction. With the support of knowledgeable others, learners can accomplish complex tasks beyond their initial ability and internalise new concepts and skills (Vygotsky, 1978). Similar findings were reported by Tondeur et al. (2020).

Ffion used Zoom to create meaningful context for oral language development and to support deeper engagement with content. When teaching te reo Māori, she designed the activity for STs to experience real-world scenarios. She used the recording facility on Zoom to record native speakers of the Māori language, for STs to see and hear how they spoke and pronounced the words. She then used the LMS to share the Zoom recordings with the STs. Ffion said, "The main purpose was for STs to hear how other people speak in te reo Māori." She then encouraged them to refine their conversational skills by practising speaking in te reo Māori. She said, "We actually used Zoom mainly for students to work together and hear the language." STs recorded themselves speaking te reo Māori words, shared their audio clips, listened to one another for fluency checks and gave each other social support and explicit feedback in real-time. STs personalised their learning by using their mobile devices to listen to their recordings anytime, anywhere, and at their own pace, which supported continuous self-learning. This task required STs to plan, produce, and reflect on spoken language in context, supporting their development of fluency, confidence, and communicative competence. Ffion explained why and how she facilitated this course:

For us, it is about students making connections. They say they don't have enough time for Māori, to hear other people using it or to get support. So at least each week they [in a small group] must meet in a Zoom, they hear each other talk Māori and then at the lecture we will watch [some of it] it and are given formative feedback about what we were hearing, what some of the sounds were, . . . is more about the hearing of the language, because we give them a lot of feedback about pronunciation, about what they're saying as well as the other grammar stuff.

Scaffolding authentic technology experiences plays a critical role in strengthening STs' readiness to integrate technology in their future classrooms, as they learn to make pedagogical decisions in realistic contexts rather than decontextualised settings.

In terms of AI integration, TEs must be involved in selecting appropriate tools for specific learning goals, defining acceptable use, and shaping AI policies. For example, teachers in schools are using subject content tools such as AI to support the development of oral language skills (Crompton & Burke, 2022). For AI to enhance pedagogical practice and support evidence-informed teaching, AI tools must be aligned with learning outcomes, assessment principles, and disciplinary pedagogies. A key lesson from Ffion's use of technology is that AI should enhance and not replace critical thinking, creativity, and social skills.

Narrative Episode 2: Technology as a Tool for Flipping the Classroom

Ffion used technology to enable flexibility, accessibility, and interactive learning. Her story and my observation of her practices indicated that the flipped classroom, an innovative teaching strategy, supported both F2F and distance study options. She drew my attention to the positive educational outcomes associated with flipped classroom. She said STs had "enough time to choose how they want to do their assignments, and [also] ... choose something interesting for them." Also, "it gives them more time to learn independently and for them to plan how they might want to study as well." Besides the flipped classroom model giving Ffion an insight into what she needed to cover, she pointed out that, "it also helped me know that I needed to work a bit more with the students."

Ffion started the F2F session by introducing me briefly, then reviewed the previous lesson by asking questions. Next, the STs took an online quiz in pairs, which was about a class reading activity they had been given. She reviewed the questions that were challenging. The next activity involved a PowerPoint presentation about supporting students to be confident and competent learners, according to the five principles of the curriculum. She facilitated critical discussions about the principles listed in the curriculum, as required by the Education Council. I realised she expected STs to engage with the content independently before class and prepare for the lesson by attempting some questions. She uploaded to the LMS course site (one week before class time), "the readings, short video recordings of resources that are related to the course or the topic so that students [STs] can watch, review, and comment online, then they can debate during class time." The following instruction was posted on the LMS course site:

Please complete the . . . quiz. This will be based on the readings. There is a 15-minute timeframe for the quiz, and you can complete it as many times as you wish. Watch the video: . . . Note 2 things that you find interesting. Bring your answers to the workshop . . . The reading and links are available in the workshop section of this week's [course site]. Please complete the workshop tasks before class.

The LMS provided a framework for Ffion to organise the activity and served as a vehicle to deliver the

content. She posted or linked learning materials for STs to access before the F2F session. It appears Ffion gave STs more control of the learning process by asking them to oversee their learning. During their class sessions, it was expected that they would contribute to the discussions about those readings and/or the videos, engage in collaboration and problem-solving. Collaboration is frequently highlighted within studies on 21st-century skills as a pedagogical strategy that enhances students' engagement and motivation to learn (Tondeur et al., 2020). Furthermore, it seems that with flipping the classroom, STs were not limited by time and place to access their learning because she organised for them to have "quite a long time to read and do the tasks any time . . . about six days really-to do all the tasks and the readings-before the session." Beyond enhancing flexibility, it seems STs had more time to engage meaningfully with the content.

By leveraging the flipped model, she successfully used class time to facilitate higher-order learning (Akçayır & Akçayır, 2018). After discussing the principles of the curriculum, she used Padlet to support STs in developing confidence in navigating digital environments. Padlet enabled her to break down complex tasks into manageable steps and to increase engagement. Each column on the Padlet wall explained each principle, paired with exemplars and reflective prompts. STs were required to work in groups and find images online that they thought represented the intent of the principle of each column and upload them to the Padlet wall. They were then to provide a summary of why they believed the image reflects the principle (from the course site). She said posting images on the Padlet wall allows every group's contribution to be seen by the entire class, but also "it gets them thinking a bit differently and exploring how their peers see things." This suggests that the use of Padlet for information sharing enabled STs to contribute to their peers' learning and deepen their own understanding, reflecting the social-constructivist view that knowledge is co-constructed through collaborative engagement (Vygotsky, 1978). This exchange and contrast of different perspectives enhance critical thinking skills (Obonyo & Thomas, 2025). This activity enhanced collaborative inquiry, mimicking the professional learning communities of real schools.

Later, Ffion projected the Padlet wall on the whiteboard for all the STs to see and contribute their thoughts. An hour later, after reflecting on the activity, a member of each group orally presented their findings. STs asked critical questions and provided alternative interpretations of the images, extending the social construction of knowledge, as stated:

We had another student who interpreted an image in a bicultural way, where she had a Māori lens on it, and she had taught with it. I used her example in the session. Other students appreciated that because they could see the image, and another student had posted a quite similar image, but

had a very Western way of looking at the image and how it met what we were looking for. So the students could see different perspectives and ways of thinking about things.

Posting on the Padlet facilitated metacognitive development since STs had time to reflect on their views before sharing with their peers. Engaging in metacognitive practices, such as reflection-in-action, enhances students' ability to transfer knowledge to new contexts (Obonyo & Thomas, 2025). This learning activity appeared to enrich STs' learning process because Ffion said: "what was great is that the STs got better from their first presentations to the last ones." It appears that STs engaged in a higher level of reflection, developing a set of ideas through group reflection and co-construction.

Just like Ffion used various tools to facilitate pre-class learning, for an AI-enhanced flipped classroom, this means using AI as a pre-class tool. STs can use AI tutors to obtain personalised academic support that extends their conceptual understanding and improves their readiness for class (Crompton & Burke, 2022). Their use may also mitigate persistent challenges related to inadequate pre-class preparation and the need for additional guidance outside scheduled class time (Akçayır & Akçayır, 2018). However, STs will need to assess the quality and reliability of AI-generated content critically.

Narrative Episode 3: Technology as a Tool for Connection

Ffion reflected on how technology enabled her to facilitate hybrid learning by bridging distance learning and F2F study options. Although it was a period marked by uncertainty, technology became a lifeline. A live video conferencing (VC) approach, audio-visual resources, weekly synchronous chat sessions that enhanced instant feedback, and a discussion forum on the LMS enabled her to connect two different learning environments, the physical classroom and online. She said using VC to facilitate distance learning was relevant, for "the ability for me to connect with the students is huge. You know... with our distance students, what they all want is to connect to someone. That is very strong. Just the fact that they can see you." She emerged as an early adopter of Adobe Connect VC and Padlet, leveraging these platforms to facilitate the sessions synchronously, enabling distance and F2F STs to engage simultaneously. Their use not only aligned with flipped learning principles but also extended pedagogical interactions beyond the spatial limitations of traditional classrooms. Ferdig and Kennedy (2014) noted that "the new expectation of a successful and effective educator in the 21st century will be one who can blend the best technology-based resources with engaging pedagogical strategies in both online as well as face-to-face settings" (p. 221).

Ffion used synchronous sessions not simply to deliver content, but to create a sense of presence and community. She explained how she provided distance STs with explicit scaffolding on how to use Adobe

Connect as an alternative to the F2F session. "In the first week [of the course], I get the students to bring their mobile devices, their headphones, particularly whatever device they are going to use during Adobe Connect, and we go into public classrooms [on campus] to have a mock Adobe Connect." Ever mindful that the STs would be by themselves in different locations during the sessions, Ffion ensured that they could access Adobe Connect. Although the ITE department had several computer laboratories that she could have used, she considered that the STs needed to understand how to use their own devices to join the sessions and participate in the learning, which helps in reducing cognitive load and increasing confidence. She said, "It is easy to use the computer lab, but when they get home, they've got different computers or devices. So, they need to know where the microphone or camera is and all that." She also conveyed the idea that learning with mobile technologies is not restricted to a specific time and place. She effectively collaborated with the STs to identify mutually convenient times for the sessions, in alignment with the established F2F schedule. "We also agree on a suitable time to have Adobe Connect with them." This is something she always endeavoured to do, because she found, "in previous years, we put a time up and students [STs] could not come. That's quite discouraging, you know, that's not good for us."

Ffion designed for two modalities at once by focusing on time, space and interaction. She said, "Sometimes I need them to prepare some work so that I know what to cover. So, a week before, I will let them know this is what we will do, I want you to put your thoughts on this Padlet." STs participated together in a shared forum and posted on the Padlet wall, which enabled her to sample some of their work as exemplars when facilitating the sessions. "I take little snapshots of their postings on Padlets to talk about with them [STs], and I use them ... to reinforce my teaching." She would begin by "looking at the Padlet wall and making decisions about what I'm teaching," linking her teaching to STs' needs. She further used Padlet as a platform to prepare the STs for what she was going to cover, seek STs' feedback, and respond to their comments.

Although studies have indicated that distance students feel less connected and isolated, she supported equitable participation by pairing distance and F2F STs, using Padlet to "visualise their ideas and display them clearly," and giving them "the right to talk on Adobe Connect so that they can present at any time during the [small group] sessions." Ffion said, "the quality of feedback/feedforward was very high ... Students demonstrated the ability to offer constructive comments focused on the work they viewed." Creating virtual learning communities and constructing meaning through virtual learning conversations seemed to create cognitive presence. This finding affirms Akçayır and Akçayır (2018)

argument that cognitive presence allows online learners to have access to one another, although they might be dispersed through time and space. Digital tools made it possible for STs to work on their tasks ahead of their session, to create and share digital artefacts with their peers from different locations, and to engage in learning conversations with one another and with Ffion. This indicates that the affordances of the increasing ubiquity of mobile technologies enhanced 'anytime and anywhere' learning. Resource sharing, which was enhanced by Padlet, permitted STs to look at subject content in new ways to support metacognitive reflective and connect their learning to real-life. She elaborated that when STs post their work on Padlet, "it's there all the time, and they can go back and see the comments. . . . We can highlight bits that people have done. So, I think that it [Padlet] has a real strength that we can think about, particularly for assessments."

The use of the flipped learning model seemed to allow distance STs to have enough time to research their tasks, watch the recorded lectures, and be ready for their discussions during their Adobe Connect session. I observed on their LMS course site that Ffion expected them to "share at least one key point you took from watching the lecture. Share your questions, comments, and/or thoughts with your group. Anything that needs clarifying?" Ffion noted that if she "had not given them [distance STs] that briefing, the learning wouldn't have been as rich." She continued to say, "we would have run out of time probably. But because they could do the work before the session and set it up [on Padlet] meant that we did not have to spend so much time trying to unpack as a group."

Ffion chose digital tools that connected distance and F2F STs, and designed learning that was accessible, interactive, and equitable across the two modalities. This enables STs to learn how to integrate technology and develop the competencies they will need in their future careers. In terms of AI integration, TEs need to know how to adapt AI tools to specific teaching needs. Ffion's story suggests that AI tools must be evaluated for their capacity to connect modalities, support personalised learning, and reflection. The challenge is to ensure that AI-mediated interactions support meaningful relationships between TEs and STs.

Narrative Episode 4: Professional Development is Essential and Must Be Ongoing

Navigating the accelerated shifts of the technological landscape requires a transition toward adaptive expertise, where continuous learning is framed as a strategic necessity for professional resilience. Strozzi-Heckler (2014) stressed that "we must be learning individuals in learning organisations (p. 1). Inadequate professional development and training are the most cited reasons for the lack of technology integration. As Ffion innovated with technology, I was curious to know how she

learned to integrate mobile technologies into her teaching and enhance her digital competency. Ffion spoke unhesitatingly about how she was self-taught and kept herself up to date with the rapidly changing mobile technologies. It would appear Ffion did not receive formal mobile learning training, for she said, "I think that's a really great question, because-I have to be honest-everything I've done is just because I've given it a go, not because I've actually sat down with someone who's helped me through it."

Ffion demonstrated a strong passion for her work and actively created opportunities to reflect on her practice and share her insights with others. She was willing to incorporate technology into teaching even when she struggled to use it. For example, she would network with her colleagues to share her experience, which appeared to foster trust, relevance, and sustainable adoption. She remembered how she could problem-solve with Sue, whom she was co-teaching, which seemed to boost Ffion's confidence in using mobile technologies. She elaborated on this: "I network with [Sue] . . . We just sit down, and we say we're going to do this . . . and we just do that, and we hope it works really." Her experience supports findings that collaborative strategies such as professional collaboration, teacher talks, and faculty-wide mentoring programmes help develop teachers' TPACK (Diliberti et al., 2025; Tondeur et al., 2020). Although she did not mention engaging in professional learning communities, her experience suggests that she may have learned to integrate technology into her teaching through online sources, and she seemed ready to overcome any setback. Research indicates that successful technology integration requires sustained, iterative professional learning that progresses from introductory to advanced topics as educators gain confidence, rather than one-off workshops (Cochrane, 2014). Research further reveals that training TEs is necessary, and developing a technology plan at the ITE programme level contributes to meaningful integration (Farjon et al., 2019).

With AI becoming increasingly embedded in school practice, TEs require ongoing, scaffolded opportunities to experiment with AI and reflect on their implications. This will enable them to build ethical, pedagogical, and technical competence so they can remain current with technological developments and effectively prepare STs for their teaching profession. Crompton et al. (2024) emphasised the need for professional development "to show AIEd best practices and frameworks that support teacher understanding of how AI technology can be used effectively" (p. 263). To maintain professional efficacy within the current technological advancements, TEs must move beyond functional literacy toward metacognitive agility, where learning is viewed as a continuous process of unlearning and re-evaluating pedagogical frameworks.

Narrative Episode 5: Technology can widen inequalities

Although technology provides valuable learning opportunities, these benefits are not experienced equally. Inequalities can widen when learners differ in access, device quality, and digital skills, shaping the overall quality of their learning experiences. The institution had good internet connectivity. However, while using technology to support her teaching, her main concern centred on device accessibility and the digital skills of the STs, leading her to request that they bring their own devices (BYOD). STs positively received this since they were eager to embrace the use of mobile devices. All of them had access to a mobile device and a reliable internet connection. Ffion commented: "We design in-class quizzes using Quizlet, and students [STs] choose to bring their own devices to do that [the quizzes]. In fact, many students [STs] used their smartphones rather than computers." In this part of her narrative, it was evident that Ffion was aware that technology can widen inequalities if access, support, and design are not equitable. I also observed Ffion introducing the BYOD approach to support in-class group interactions better.

STs can use mobile devices that are loaned and controlled by their institutions. However, this could limit opportunities for personalised and collaborative learning. Schuck et al. (2017, p. 130) noted "the increasing levels of student ownership of devices mean that learners now take control of their own learning technologies." When STs use their own mobile devices, they can demonstrate autonomy in choosing the context, time, and pace of their learning (Obonyo, 2020). When AI is part of the learning environment, learners can take ownership of how they interact with AI tools. However, this raises questions about data privacy, consent, and the security of AI-enabled apps running on personal devices. A future possibility implies that AI integration must explicitly address digital divides, accessibility, and diverse learner needs. Inclusive design principles should guide tool selection and implementation.

V. CLOSING THOUGHTS

This study contributes to the literature by revealing Ffion's lived experience through the integration of self-reported data and observations from F2F and online classroom settings of her practices. This paper has presented Ffion's story as a coherent narrative, supported by thematic threads that illuminate recurring patterns across episodes. While the episodes presented here are situated within ITE in New Zealand, they serve as interpretive lenses for understanding technology integration and pedagogical decision-making, with relevance to the integration of AI in teacher preparation. This narrative reveals how Ffion designed and implemented pedagogical strategies that modelled effective technology integration, providing STs with authentic opportunities to participate in technology-

mediated learning. This principle aligns with the TPACK framework, which emphasises that effective instructional practices arise from the interplay of content knowledge, pedagogically sound strategies, and technologically responsive practices.

This narrative highlights the importance of modelling responsible technology use and creating opportunities for STs to practise critical engagement with digital tools. Ffion's experience demonstrates that technology, when used purposefully, can enhance authentic learning, a flipped classroom, and strengthen connections between F2F and distance STs while supporting the design of learning that is accessible, interactive, and equitable across both modalities.

Generalisation is not possible. Nevertheless, understanding these experiences can offer valuable insights into how TEs traverse the challenges of integrating technology, while also informing emerging approaches to AI integration in ITE. For example, Episode 3 illustrates how technology served as a bridge for connection as she successfully navigated and overcame the challenges it entailed. Ffion said, "In previous years, we put a time up and students [STs] could not come. That's quite discouraging." Coupled with the successful integration illuminated in this narrative, there is a need for continuous professional development. Examining the integration of AI in ITE helps to clarify how AI enhances the preparation of STs.

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Abbreviations: The following abbreviations were used in this manuscript:

TE	Teacher Educator
STs	Student Teachers
ITE	Initial Teacher Education
AI	Artificial Intelligence
LMS	Learning Management System
BYOD	Bring Your Own Device
TPACK	Technological Pedagogical Content Knowledge

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