Learning to Teach with Technology

Traversing the Initial Teacher Education Landscape

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Abstract

Embedding technology into education is a global phenomenon. While the New Zealand government has invested large sums of money into building the technology infrastructure within schools and early childhood centres, and supporting teacher in-service learning to utilise digital technologies in the last few years, there is a dearth of in-depth studies in the teacher education context that examine the lived experiences of learning to teach with and through digital technologies. This research focuses on understanding how digital technology enables professional learning for three Chinese students as they navigate the journey of becoming early childhood educators in the New Zealand teacher education context. I draw on the concept of complexity thinking to study teacher education as an interconnected, dynamic, and complex system that configures students' learning journeys. I use a bricolage method (Kincheloe, 2001) to guide the investigative process. This bricolage accommodates the relationship between me–a bricoleur–and the objects of this research. Participant observation, document analysis, individual interview, and focus group interviews are the main sources of data. The key findings show that Mandarin-speaking student teachers, who value connectedness, group harmony, diligence in learning and academic achievement, need to construct a cultural identity which achieves a balance between two different cultures when learning to teach. Technology, as an evolving nexus of devices and learning tools, is a constant and is important to student teachers' professional learning. A variety of interdependent factors, such as the affordances provided by digital and mobile devices, the design of teacher education programme, teacher educators' use of technology, and student teachers' prior experiences, all impact on student teachers' use of technology. Based on the data, building a community of learners, for social and professional reasons, appears to be the most important affordance of technology. Even though the student teachers have experienced using technology, they did not learn much about how to use it as a part of their pedagogy during this programme; the feeling is that technology should not substitute for the embodied pedagogies of the teacher educator. In conclusion, the study suggests that supporting early childhood education (ECE) student teachers to be proficient users of digital technologies in their professional practice is not straightforward nor linear. Rather, becoming pedagogically proficient is enabled by how technology is socially situated within, and distributed across, the social and professional contexts of the individual.

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Chapter 1. Introduction

This research focuses on understanding how digital technology enables professional learning for three Chinese students as they navigate the journey of becoming early childhood educators in the New Zealand teacher education context. In this study, I draw on the concept of complexity thinking to study the teacher education process as an interconnected, dynamic, and complex system that configures students' learning journeys. Inherent to framing learning to teach in this way is the assumption that the journey is a continual process of becoming different in relation to the context. The process is not to 'be' or become a 'singular' teacher but rather a process of 'becoming teacher' (Strom, 2014)–a process through which the teacher is always emerging, always evolving and adapting, always something different than he or she was before, and will be, in the future.

While the New Zealand government has invested large sums of money into building the technology infrastructure within schools and early childhood centres, and supporting teacher in-service learning to utilise digital technologies in the last few years, there is a dearth of in-depth studies in the teacher education context and of the lived experiences of learning to teach with and through digital technologies (Rivers & Rivers, 2004; Wright, 2010). This research will explore technology as an 'enabling constraint' (Davis & Sumara, 2006) in teaching and learning throughout the journey of 'becoming teacher' in a one-year Graduate Diploma programme.

In New Zealand, the journey of transition from student teacher to qualified teacher is highly programmed through a series of pedagogical experiences designed to ensure graduates meet mandated standards seen as essential to professional practice as a teacher (Alcorn, 2014; Ell, 2011). However, despite traversing much the same set of activities, the experience is by no means the same for all students. Therefore, the key focus of this study is oriented around understanding the complexity of 'becoming teacher' from three Chinese students' perspectives, particularly as it is mediated by the growing influence of digital technologies in educational practice.

The participants of this research are three Mandarin-speaking Chinese students studying in an early childhood teacher education diploma programme in New Zealand. The complexity of

‘becoming teacher’ in the New Zealand context for a foreign Chinese learner includes the experience of shifting to New Zealand, becoming immersed in a new culture, grappling with the intricacies of the English language, and navigating a course of study and meeting academic expectations to be a qualified teacher (Arndt, 2014). Therefore, the becoming process is much more complex. From a complexity perspective, the process of ‘becoming teacher’, is a cascading set of adaptations and events influenced by a complex socio-political network of factors. Students are positioned within, and as part of, this network. Their prior knowledge of, and confidence using technology mediates the sense they make of the experiences they have in initial teacher education programmes. In this case, studying the experiences of Chinese students in the New Zealand context is what makes this project unique and valuable. It examines how Chinese international student teachers use technology (e-portfolios, online learning management system, and access to websites, blogs, social media, *et cetera*) as a tool for their own learning in New Zealand. It seeks to understand how they ‘become teacher’ within the context of early childhood education and how this is enabled and constrained by the integration of digital technology into teacher education.

1.1. As a Bricoleur

In order to explore the complexity of the learning journeys, I use bricolage (Denzin & Lincoln, 1999; Kincheloe, 2001; Levi-Strauss, 1966; Rogers, 2012) as the method during the research process. Bricolage refers to a critical, multi-perspectival approach to research. The word bricolage stems from a traditional French expression ‘bricoleur’, which refers to the creative craftspeople using materials at hand to construct new artefacts (Levi-Strauss, 1966). During this research process, I work as a bricoleur to explore the learning journey.

I am a Chinese doctoral student studying in Auckland, New Zealand. Before this doctoral study, my educational background was rooted in China. I was born in 1990 and grew up in a coastal city in the northeast part of China. My childhood memories are faded. I do not recall the first day when I started kindergarten, but I know that it was a small centre located in our community, with around 40 children and three teachers. In the 1990s, unlike nowadays, digital devices were not common in kindergartens. There was a small playground with a carousel, a slide, and a swing in my kindergarten. However, teachers preferred to keep us in the classroom, rather than let us play outside on the playground, due to safety considerations. There were a few toys for

us to play with inside. I remember some pictures hanging around on the walls and some books in a corner. Well-behaved children would be allowed to play outside on the playground as a reward.

I was enrolled in a primary school when I was six years old. There were around 30 students in each class and each grade had two classes. Students sat in lines in the classroom facing the blackboard. Teachers usually lectured in the front of the classroom using a blackboard and chalk. There was an overhead projector for general use in the staff room. Teachers had to negotiate with others when they could use the projector. English was a compulsory subject from the fourth grade (or when we were ten years old). There were various extracurricular activities such as calligraphy and drum corps.

I took part in the computer interest group since computers were just beginning to emerge in schools. At that time, computers were not common in homes and the computers in the school's computer laboratories were bulky 486s and 586s.[1] I began to know and practice how to type when I was in that computer interest group. Then, I went to secondary school where the projectors were common in every classroom. By the time I was 15 and in high school, the technology had developed rapidly. Desktop computers were common in the average home and people could get access to the internet through the dial-up service. There was a TV, a computer, and a data projector in every classroom in my high school.

After I graduated from high school, I began university in another city in central China. For convenience and ease of transport, my parents bought me a laptop. I used to use the laptop in my dormitory, but not in the lecture room. I preferred to take notes with a pen and paper during lectures. Assignments were submitted on paper and students could choose to turn in a hand-written paper or typed paper. At first, I used to write my assignments on paper with a pen. However, I had to spend extra time on writing because I had to write and revise my draft, then, copy my final draft onto new paper to make my assignments clean and clear, with no mistakes. Then, I found it was easier to hand in typed papers because I could write and revise in a Word document, and the Word software could help check grammar and spelling mistakes automatically. The university I attended introduced a learning management system. I could select courses and view my grades through it online. This learning management system was

[1] 486 is the fourth generation of the Intel x86 family of CPU chips. The term may refer to the chip or to a PC that used it. Introduced in 1989, it was the successor to the 386 and the first chip in the line to include a built-in math coprocessor. 586 is a Pentium-class chip made by a company other than Intel. Retrieved from https://www.pcmag.com/encyclopedia.

merely a tool to select courses and record grades. The lecturers usually made the PowerPoints available through email or cloud storage. The class monitor set up a QQ group[2] where students from the same major could communicate with each other online. I received my bachelor's degree in Education and a master's degree in Curriculum and Pedagogy.

My own educational background bears witness to the development of digital technologies. I experienced first-hand the changes that technology brought to education. When I was in primary school, the use of a projector instead of the blackboard stimulated my interest and curiosity of learning. As technology evolved, I became more familiar with technologies used in education. Besides considering technology as interesting stimulation, I found it enhanced and transformed learning, such as the use of Word software and learning management system. The changes I experienced were vastly different from my parents and also from children born in the 21st century. The rapid change of technologies has been dramatic from the 1990s to the beginning of the 21st century. From overhead projectors and bulky 486s to data projectors and laptops, I experienced rapid change during my primary and secondary schooling. My parents had no access to projectors or computers in their schools. Nowadays, children born in the 21st century have had access to these technologies since they were in kindergarten. Furthermore, the technology tools they have had access to have become faster and cheaper. My interest in exploring other students' learning experiences with technology as a thread was piqued.

New Zealand is the first foreign country I have ever visited. As a Mandarin-speaking Chinese student, English is my second language. Even though I have been studying English from the fourth grade, I still find it challenging to study and live in a western country. My educational background in China gives me empathy for, and insight into, Mandarin-speaking Chinese students' learning journeys in New Zealand since we share similar cultural and language backgrounds.

This brief educational history is meant to not only introduce myself, but also locate myself within the research assemblage. As a bricoleur, it is important to recognise the social production of self, the impact of selfhood on perceptions, and the influence of perception on the research process (Kincheloe & Berry, 2004; Pickering, 1999; Richardson & Woolfolk, 1994). A bricolage must accommodate the relationship between a researcher's perspective and biography (Kincheloe & Berry, 2004). Compared with passive, monological research methods, as a bricoleur, my previous experience, my perceptions of the research context, and my

[2] Tencent QQ, also known as QQ, is an instant messaging software service and web portal.

aspirations and desires for doing the research fold into how the inquiry process is assembled, arranged, and performed. The bricolage also accommodates the relationship between the participants' perspectives and biography, and the relationship between the researcher and participants, or the objects of the research. Bricoleurs recognise that researchers' interactions with the objects of their inquiries are complicated, mercurial, unpredictable, layered, and complex (Kincheloe & Berry, 2004). Bricoleurs consider that performances of empirical research are inscribed with meaning by human beings, which means the researcher's perceptions and assumptions are a part of the outcome of the research. The research process is subjective. Repressing or neutralising subjectivity is impossible, so the bricoleur attempts to realise their role in shaping the research. Instead of explaining the world, the bricoleur also focuses on the explanation of their relation to the world (Kincheloe & Berry, 2004).

1.2. Research Problem

In an era of rapidly developing digital technologies and increased interest in improving the learning outcomes for all young people, educating and supporting high quality, committed, novice teachers to teach a diverse population of early childhood students and take advantage of the affordances that digital technologies provide, must be a top priority (Education Council, 2017).

Considering the importance and complexity of teacher education, the study of learning to teach is of great significance. Given the individual's unique experience during the process of becoming a teacher (Flores, 2001; Grudnoff, 2007), the question of student teacher's subjectivity is valuable to explore. As a Mandarin-speaking doctoral student and researcher, I am interested in Chinese students' journeys in particular. This research deeply explores three Mandarin-speaking student teachers' unique journeys through their one-year process of becoming teachers. The question is not whether or not we should use technology that is being researched. Rather, the problem is oriented around how technology could become integrated into the learning environment as both a process and outcome of teacher education. The main research question is, *how does technology impact on the journey of becoming teacher?* To help provide more focus, the sub-questions guiding the inquiry are:

1. What is the experience for Mandarin-speaking students learning in a New Zealand context?

2. How does technology influence and impact on the process of learning to teach?
3. How does my understanding of learning to teach with technology become reframed through the research study?

1.3. Contextualising the Programme

This research is conducted in the city of Auckland, New Zealand. An important reason why I chose this site is that Auckland is the most multicultural city in New Zealand. The number of Chinese students is increasing in New Zealand in recent years (Statistics New Zealand, 2013). I also chose early childhood teacher education because the 2013 Census shows that the third largest ethnic group of early childhood teachers in New Zealand (12%) was Asian. While most early childhood teachers are European, the proportion of Asian teachers is higher than for the general working population and for teachers in the other education sectors (Statistics New Zealand, 2013). Therefore, it is of value to study Chinese student teachers' learning journeys in the New Zealand context.

a. Initial teacher education in New Zealand

The participants of this study were enrolled in the same initial teacher education programme provided by a university located in Auckland, New Zealand. It was an intensive one-year Graduate Diploma in Teaching (Early Childhood Education) programme.

There are 156 approved ITE programmes in New Zealand, delivered as 80 qualifications by 25 providers. Approved programmes include undergraduate degrees of three or four years, undergraduate diplomas of three years (in early childhood education), and one-year graduate diplomas (if the student already has a relevant qualification at level 7 or above).[3]

Prospective students need to meet certain academic entry requirements and be competent in one of the languages of the national curriculum–English or Māori–to become a teacher in New Zealand. To ensure that the teachers are of consistently high quality, all initial teacher education graduates must meet the Graduating Teacher Standards (Education Council, 2015) in a supported environment.

[3] https://teachingcouncil.nz/content/studying-be-teacher

b. Early childhood education in New Zealand

There are many different sorts of early childhood education (ECE) services available in rural and urban New Zealand, including teacher-led services, kindergartens, home-based services, education and care centres, parent-led services, play centres, playgroups, Ngā puna kōhungahunga, and Pacific Islands Early Childhood groups. They are different in the structure (such as sessional or all-day programmes), ownership, and organisational arrangements. Private individuals, government organisations, cooperatives, or trusts may run the services. The learning environment (such as home-based or centre-based services) is influenced by different philosophies (including, for example, Montessori and Rudolf Steiner programmes or kaupapa Maori). The key difference that may affect the parent's choice is how much involvement services expect of parents and whānau. For example, 'Whānau-led' or 'parent-led' means parents, whānau, or caregivers are involved in educating and caring for the children. These services recognise the importance of parent and whānau training and involvement. Families and whānau have the opportunity to learn more about parenting, develop social and community networks, and build greater confidence, as well as lead the education and care of their children. All ECE services and kōhanga reo are licensed or certificated by the Ministry of Education.

Early childhood teachers in New Zealand embrace the idea of expertise. They are not 'nurses', nor in the business of relieving mothers of their responsibilities. With the establishment of the New Zealand Free Kindergarten Teacher's Association in 1954, early childhood teachers began the long journey towards professionalisation and gained recognition and status for their work with children. At the request of the Ministry of Education, early learning services in New Zealand must meet qualification requirements for licensing. The requirements vary depending on the type of early learning service. For instance, in teacher-led, centre-based services, at least 50% of required staff must have a recognised ECE teaching qualification. The person responsible must have a recognised qualification and a current practising certificate. Therefore, to be a responsible ECE teacher, the students need formally recognised qualifications.

1.4. Structure of the Thesis

This thesis consists of eight chapters. It outlines the complexity of three Chinese students' learning journeys with technology as an enabling constraint. Each chapter contributes to illustrating the complex becoming process, full of uncertainty and possibility. The structure of

this thesis reflects a balance between the accepted standards for a PhD thesis and the information that emerged from the data. The 'balance' reflects the complexity of this writing process, during which I walked through the data and then walked out of the data and sewed the information I got from the data into a PhD thesis. It is a process walking backward and forward. For more problematization of this portrayal of balance in relation to the complexity theory, it could refer to a dynamic balance. In complexity, the balance could be between chaos and stability. It is not possible nor aimed to control the complexity but to manage it. This created some tension and I have crafted and recrafted the chapters in order to illustrate and theorise the students' journeys appropriately. The production of this work is a bricolage process influenced by complexity thinking.

In this introductory chapter (Chapter 1), I have introduced the research problem and set up the context and rationale for the reader in an abbreviated way. By introducing my personal, previous experiences, I have explained my interest in this research and illustrated my position and perspective as a bricoleur in this study.

In Chapter 2, I draw on literature to examine the concept of complexity as the underpinning philosophical framework of the thesis. I examine the concept of teacher education and discuss the fundamental problems that teacher education attempts to address. Then, I review the literature about technology as an enabling constraint in education. Lastly, research on the challenges and experiences of Chinese students in the New Zealand context are reviewed.

Chapter 3 outlines the research methodology used in this study. I begin by clarifying how I have enacted bricolage (Kincheloe, 2001) for this thesis. Then, I explain how I have generated data. Thirdly, I illustrate the data analysis and representation processes.

In Chapter 4 I outline the learning journey, including an introduction to the early childhood teacher education programme, the criteria of entry into the programme, a description of the Induction Day, the general situation of technology used in the programme, and the teaching pedagogy.

The findings chapters, Chapter 5, Chapter 6, and Chapter 7 are organised in response to the research questions. The three chapters separately describe the three Mandarin-speaking students' learning journeys, divided into an 'on campus' section and an 'on practicum' section.

In Chapter 8, I firstly introduced Chinese students as a group of learners based on the three fundamental problems. Then, the technology affordances and my reflections as a bricoleur are further discussed in the conclusions of Chapter 8.

Chapter 2. Literature Review

In this chapter, I begin by firstly examining the problem of complexity in educational phenomena and discuss 'complexity thinking' as the underpinning philosophical framework of the thesis. I then examine the concept of teacher education and discuss the central problems that teacher education attempts to address. Thirdly, I review the literature about technology as an enabling constraint in teacher education. The second and third sections review the context of teacher education and technology's place in that context. Then, the experiences and challenges of Chinese students in New Zealand are reviewed. By doing so, I outline the theoretical and conceptual framework of the thesis and suggest there is a lack of research which informs the practice of Chinese students' learning journeys in teacher education in the New Zealand context.

2.1. Complexity

Davis and Sumara (2006) use the acronym VUCA (volatile, uncertain, complex and ambiguous) to summarise the features of educational phenomena. However, they also argue that defining the concept of complexity and its implications for research is not easy (Davis et al., 2004). For this research, I undertake this task by outlining the main beliefs that frame a complexity worldview and then consider what this implies for the process of learning to teach.

a. Complexity as a world view

Underpinning my understanding of complexity as a world view are the following four beliefs.

Firstly, there is a key point of difference between complex and complicated systems. Traditionally, research has always dealt with complexity, but in different ways. Weaver (1948) provides a useful way of understanding these differences as different systems. Weaver (1948) described science evolving from a science of simple systems to a science of complex systems from the 17th to 20th century. Both complex and complicated systems consist of many parts and interactions. However, in complicated systems, the way the whole system behaves is the sum of its separate parts. In other words, by examining the individual pieces and the system process, the concluding function and the outcomes of the wholes are predictable. The relationships

between the pieces are static and clearly defined. An example might be that the many parts of a car engine are put together in a very complicated system, but the end result is always to produce the same functionality–a working engine. This engine will always provide the same response to a given input. For example, push the accelerator pedal and the engine will go faster. By contrast, the relationships and interactions among the elements in complex systems are multidimensional and dynamic (Byrne, 1998; Cilliers, 1998; Haggis, 2008), which enables the outcomes of complex systems to be varied and unpredictable, but not random nor chaotic. The same input does not always result in the same response. For example, saying 'good morning' to someone will not always result in the same response each day. A game of rugby might also be considered complex. Even though 15 players, one ball, one referee, and two linesmen take to the field, other factors such as the crowd, weather, state of the ground, incentives, motivations all play a part in the uncertain end results.

Secondly, at the heart of a complexity worldview is the understanding that connections and relationships enable and mediate possibilities. Everything influences and is influenced by the network of connections between all components of the world and the forms of relationships this allows. This relationality, and the collective entities it enables, have been labelled in a variety of ways in the literature, including systems, networks, assemblages, entanglements, communities, mangles, *et cetera* (Barad, 2007; Daly, 2010; Deleuze & Guattari, 1987). While not theoretically the same, each one of these terms conceptualises the entity as the product of the relationships between constituent parts. For example, social network theory focuses on connections between people (Daly, 2010). Systems theory takes this a little further and considers connections to processes, as well as people (Cilliers, 2005). However, both consider the relationships between the parts of the system as closed and do not take account of the interactions that happen outside of the system and the interaction between systems. Complexity thinking takes this further to think about systems as 'open' in the sense that they have connections outside of the system and are capable of exchanging energy and information. Assemblages (Deleuze & Guattari, 1987), mangles, or entanglements (Barad, 2007) are yet further ways of conceptualising relationality and the way complex entities can be reconnected and reconfigured to create new entities, which are always in the process of becoming something else.

Thirdly, this relationality between dynamic components allows non-linear relationships. Different from linear causality or gradual process, the logic of non-linearity is heterogeneous connectivity and quasi-causality. That is, the rich and multiple connections within a system

allow for information to circulate and flow in different ways through a system, which means that the cause of an outcome is difficult to determine. Therefore, there are various uncertainties in the complex system, which cannot be predicted. In addition, disequilibrium is regarded as an inherent part of complex systems (Morrison, 2008). Rather than taking disturbances as 'problems' to be 'solved', we can value this disequilibrium as an opportunity for new evolutionary or revolutionary opportunities. Becoming a teacher, as stated, is a non-linear process, which is full of possibilities and uncertainty for the student teachers.

Fourthly, this enables a shift from a focus on 'being' (what something is) to one of 'becoming' (what it is capable of doing). This suggests that entities are not static beings, but are always in the process of becoming or emerging as a result of the way the constituent parts are interacting. Therefore, this implies that the entity known as 'student teacher' is one that emerges as a product of the interacting parts of the teacher education system. The same is true of the entity called 'teacher education'. Emergence implies that "as systems acquire increasingly higher degrees of organisational complexity they begin to exhibit novel properties that in some sense transcend the properties of their constituent parts, and behave in ways that cannot be predicted on the basis of the laws governing simpler systems" (Kim, 1999, p. 3). The important point here is that emergent properties cannot be predicted merely by analysing the components of the system, which means the emphasis shifts from analysing the nature of the constituent parts (being) and analysing the patterns and effects that emerge from the constituent parts in interaction with each other (becoming). It means that the important thing is that it is not worth trying to assume that teacher education has some transcendent essence or identity, and rather focus on the effect that that particular assemblage or system has.

Collectively, these four beliefs frame a complexity world view and make it possible to appreciate the way multiple interacting elements both create the school environment teachers are part of, and influence their own experience of that environment. For example, factors such as workplace conditions and school culture have an impact on teacher morale, commitment, and retention (Weiss, 1999; Williams et al., 2001). Working conditions, such as facilities, and administrative support, play a large role in teacher decisions to change schools or leave the profession altogether (Ingersoll, 2001). In relation to learning to teach, the professional work environment and its resulting school culture also have an influence on beginning teachers' learning and development (Grudnoff, 2007). Some researchers even argue that school culture has a stronger influence on beginning teachers than pre-service teacher preparation (Stanulis et al., 2002; Flores, 2001). Williams (2002) argues that new teachers with new ideas and

enthusiasm have the potential to impact on their school environment positively. In this sense, using a complexity world means accommodating the nuanced, layered and interdependent way various elements interact to enable teacher education to become a phenomenon capable of being studied.

b. Becoming

Deleuze and Guattari (1987) described the concept of *becoming* in detail in their book, *A Thousand Plateaus*. They explained this idea of becoming as a never-ending process without a beginning or ending, much like a rhizome that has no centralised growth point and instead is capable of constantly growing in multiple directions from multiple points. The concept of becoming does not describe a singularity, but instead, "becoming and multiplicity are the same thing" (Deleuze & Guattari, 1987, p. 249). The terminology of multiplicity is defined with multiple dimensions. "If you change dimensions, if you add or subtract one, you change multiplicity" (Deleuze & Guattari, 1987, p. 245).

The concept of *becoming* is similar to the concept of *emerging*. They both refer to material phenomena as the product of ongoing processes. In this research, the concept of emerging is used to describe ongoing situations, such as the way learning environments emerge from their entanglement with emerging technologies, while the concept of becoming is applied to describe how the participants' identities, experiences, and transitions from student teachers to qualified teachers in their learning journeys are always in the process of being formed and performed as part of the setting they are situated within. As to the concept of 'becoming', it is not foreseeable, but full of possibilities and uncertainty; on the other hand, an observer could conjecture that something is going to undergo 'emerging' but may not know precisely when it will happen. Emerging phenomena form patterns that are not chaotic nor stable, which enables possibilities for an observer to sense and predict, while the pattern could be changed through unexpected factors. For example, teachers could make a teaching plan based on the curriculum, their teaching experiences, and their prediction of students' reactions. However, emergent events could happen during the class and impact on teachers' teaching. Therefore, student teachers' becoming journeys are situated in an emerging system which is loosely framed by a certain pattern and enables uncertain possibilities.

Becoming is the concept that underpins my research of student teachers' journeys of 'becoming teacher'. Rather than the grammatically correct phrase 'becoming a teacher', I consciously use the phrase 'becoming teacher' to convey the idea that being a teacher is a never-ending process

rather than a finished product. This is the reason why the term 'becoming teacher', which may appear grammatically wrong, is intentional. As Ovens et al. (2016) argue, rather than "a linear, progressive movement from novice to expert teacher", this 'becoming' journey "explores untold variations in pathways; recognises multiple starting points; and contemplates ultimately what might be possible for any person intent on learning teaching". Therefore, becoming teacher takes place in "co-constitutive relatedness of practices and the social-cultural-material environments" (p. 371). 'Becoming' is an evolutionary, iterative process, which is relational, non-linear, and emergent.

c. The complex process of learning to teach

With respect to researching teacher education, complexity allows the researcher to consider the process of becoming a teacher in a more distributed, relational way. Students, teachers, classrooms, courses, early childhood centres, schools, teacher education programmes, and school-university collaborations can be studied as complex systems (e.g., Clarke & Erickson, 2009; Davis & Simmt, 2003; Davis & Sumara, 2006; Nielson et al., 2010; Radford, 2006; Russell & Martin, 2016; Waks, 2011). The relationships between the participants and their world, which includes the connections with contexts, computers, lecturers, courses, assignments, practicum experiences, peers, associate teachers, *et cetera*, are seen as circumstantially bound, non-linear, complex collectivities that simultaneously enable and constrain the experience of learning to teach.

Cochran-Smith et al. (2014) make a similar argument for understanding teacher education as complex when they say that teacher education's form is determined by societal and statutory parameters and shifts over time. Furthermore, teacher education, at all levels, is full of high-frequency, short-range, local interactions. With these various elements constantly interacting in dynamic ways, teacher education is never standing still, which means operating in a state of disequilibrium for emergence to occur. Small changes can make a big difference; disequilibrium powers a complex system's learning and change. Finally, they argue that teacher education "produces and reproduces itself through interactions at multiple levels, defined by control parameters and affected by the other systems around and within it" (p. 8).

This concept is usefully described by Madden (2015) in the following way:

> Consider a 'hiking trail' formed by the relationships among communities of animals, trees, rocks, streams, and earth; trail markings; a specified distance and level of difficulty

> described on a website; and the promise of a spectacular view. Similarly, assumptions about education and teaching, associated purposes and goals, central themes, and pedagogical methods comprise a pedagogical pathway that shapes, but does not determine, the learning journey...Moreover, like a hike rerouted due to weather, injury, blockage, or curiosity, pedagogy generates immeasurable, unpredictable, additional productions. (Madden, 2015, p. 2)

Madden's metaphor of a hiking trail helps illustrate my argument that learning to teach is a complex process. The key point here is that the journey is not a means to an end, but more a continual process of becoming different in relation to the context. A hiking trail is a journey of possibilities that unfold in the moment in relation to the setting, conditions, and aspiration of the hiker. Moreover, because of the influences of weather, injury, companions, or curiosity, each journey is different. In teacher education, multiple elements are interacting with each other and the patterns of behaviour are emergent and not determined by simple cause-effect relationships. Rather than a linear process where each individual developmentally progresses from novice to expert, the concept of becoming teacher suggests a more recursive, individualised, dynamic, and complex process (Ovens et al., 2016).

Aligned with this complexity worldview, the purpose of this research is to better understand the participants' journeys of learning to teach as they are affected by their connection to other people, places, and things, as well as being the product of interactions occurring across three levels of organisation: the level at which the individual acts and experiences learning to teach, the level at which courses or classes create specific experiences, and the level at which programmes and broader education system are influenced by socio-political events. Rather than focusing on a cohort of people's sameness, this research emphasises the individual's difference–just like the hikers' own special experience during hiking. Complexity thinking is the main theoretical framework underpinning this research, guiding the direction of what to do and the reason why.

2.2. Teacher Education

The importance of teacher education is acknowledged in developing teaching skills, even though many consider that teaching is less professional than other occupations such as doctors or lawyers, or think that anyone with enough subject knowledge can teach, or regard teachers

as self-made (Britzman, 1991). There is also research which suggests the limited influence of teacher education on teaching practice (Lampert & Ball, 1999). The process of becoming a teacher has been extensively studied for the past 30 years (Cochran-Smith & Villegas, 2015), although much of this is situated within a socialisation orientation (Grusec & Hastings, 2007; Scanlon, 2011; Zeichner & Gore, 1990). Given this, there is a need for new ways to theorise how people learn to teach.

As Fullan (1993) pointed out, "teacher education still has the honour of being simultaneously the worst problem and the best solution in education" (p. 105). While this quote points to the complex relationship teacher education has with education more broadly, in the next section I turn attention to reviewing the definition and fundamental problems in teacher education, which may help to map the context of student teachers' becoming through teacher education.

a. Definition of teacher education

The terminology used in the discourse surrounding teacher preparation has changed and reflects the developing understanding of the nature of the process of becoming a teacher. As Clark (2002) suggested, 'teacher training' and 'teacher education' are two different terms which cannot be used interchangeably. 'Teacher training', as used in the earlier literature, referred to the learning of teaching skills and management techniques. In contrast, 'teacher education' is a more educative term, which not only includes the training aspects, but also implies the professional development with aspects of knowledge, values, and attitudes. Through teacher education, student teachers learn to make appropriate pedagogical decisions according to the needs of their students and the aspirations of the official curriculum. Feiman-Nemser (2001) divided the continuum of teacher education into pre-service preparation, induction and initial professional development, and continuing professional development. While the term 'teacher education' is inclusive of the professional learning of both pre- and in-service teachers, in this study, I will use it to refer to the process of professional support and learning for pre-service teachers. Pre-service teacher education refers to "[a] programme preparing teachers to work in classrooms, variously referred to as initial teacher education or initial teacher training" (Grudnoff, 2007, p. ix). In this study, the research period is during initial teacher education, while the pre-service volunteer participant is referred to as a student teacher.

b. Fundamental problems in teacher education

While initial teacher education is an essential and vital phase in learning to teach, Darling-Hammond (2006, p. 35-40) outlines three fundamental problems that have traditionally limited its potential. She suggests that these are the problem of the 'apprenticeship of observation', the problem of enacting professional knowledge, and the problem that teaching is a dynamic and complex act. Each of these problems is discussed in turn.

i. The problem of the 'apprenticeship of observation'

As suggested by Lortie (1975), student teachers acquire much prior knowledge when they are students in traditional classroom settings before they decide to become teachers. According to Lortie, although this prior experience may have motivated them to become teachers, it also limits their appreciation of teaching. Students are only ever watching their teachers' performance without seeing the planning and decision-making that takes place before a teacher teaches. Students do not have the wherewithal "to place the teachers' actions in a pedagogically oriented framework" (Lortie, 1975, p. 62). This can lead to a tendency to imitate the superficial aspects of their teachers. Munby et al. (2001) have added to this idea by writing that good teaching cannot be easily understood because of the invisible knowledge and experience which supports teachers' decision-making is hidden.

According to Lortie (1975), this prior knowledge, or apprenticeship, amounts to about 15,000 hours of watching the teacher teach. When this apprenticeship is compared to the very short time they spend in initial teacher education programmes, getting students to look carefully at their own expectations and assumptions, let alone swapping stances to go from watching the teacher in front of them to standing on the same side of the desk as the teacher, is problematic. Constrained by this prior knowledge, student teachers tend to regard the role of teachers as giving information, transmitting knowledge, and being managers, which is an inadequate conception of what it is to be a future-focused teacher. Besides, considering the rapidly evolving nature of teaching, any knowledge or skills gained through the apprenticeship of observation, which was acquired a decade ago, may be 'out of date' in this changing digital world. Research suggests that long-term programme interventions have more influence than short-term, course-based interventions on transforming student teachers' preconceptions (Gunstone et al., 1993; Loughran et al., 2001; Weinstein, 1990; Wideen et al., 1998). Other researchers (Brouwer & Korthagen, 2005) explain the existence of a 'latency period' of teacher

preparation, which suggests that a student teacher takes on board some new understanding, but will not display those new behaviours for some time.

ii. The problem of enactment

Enactment is about how students relate the content learnt in university to their professional decision-making in a classroom setting. This is also commonly known as the theory-practice gap or theory-practice divide. Framed in this way, it is argued that student teachers learn generalised knowledge and principles in the university setting only to find it has little relevance when they encounter the localised and specific problems of the school setting. One aspect of the problem of enactment is when student teachers' broad and idealised concepts, learnt in the university setting, contrast strongly with the experience of being a beginning teacher. This is a phenomenon termed 'transition shock' (Corcoran, 1981; Farrell, 2016) or 'reality shock' (Veenman, 1984), and refers to "the collapse of missionary ideals formed during teacher training by the harsh and rude realities of everyday classroom life" (Veenman, 1984, p. 143), and is reportedly commonly found among beginning teachers. This is not an issue caused through the 'apprenticeship of observation', which implies the gap between what is obtained in schooling and what learnt in university, but rather about the gap between what is acquired in university and what is experienced in the high-pressure and complex setting of the school. This phenomenon of shock that can be disorienting for beginning teachers (Chubbock, 2008; Huberman, 1989; Veenman 1984), includes the reality shock of the actual classroom environment (Bianchini & Cazavos, 2007; Chubbock, 2008), unsatisfactory relationships with students (Bergeron, 2008), difficulties of transferring what is learnt from pre-service teacher education (Beck et al., 2007), and gaps between the innovative pedagogy taught in universities and traditional methods practised in schools (Ferguson-Patrick, 2011; McDonough, 2009). Some consider that teachers' own life experiences and the socialisation process of the school are more influential than initial teacher education (Bullough et al., 1989; Feiman-Nemser, 2001; Flores, 2001; Flores & Day, 2006; Lortie, 1975). Contrasted with this suggestion, that teacher preparation has a weak impact on the beginning teachers, some argue that what is developed during teacher education in universities is 'washed out' during teaching in schools (Lortie, 1975; Veenman, 1984; Zeichner & Tabachnick, 1981).

An alternative way of framing the problem of enactment, one that draws from a complexity world view, is to see the problem as a theory-theory gap. In other words, it recognises that universities and schools are different discourse communities (Ovens, 2002) that produce

professional knowledge differently. Students move from the university, where 'theory' about teaching is produced through an epistemology of research, to the school where 'theory' about teaching is produced through an epistemology of practice. University researchers tend to see teaching as a complicated system governed by predictable and stable laws. They have tried to generalise and look for lists that teachers can apply. By contrast, teachers tend to see teaching as a complex system that is unpredictable and dynamic. They generate local theories based on their experience of 'what works'. Framed in this way, the problem of enactment is more about the struggle that student teachers have in seeing the relevance of the knowledge learnt in the university setting to solving the complex problems they encounter when in the school setting. The complicated theories suggested by researchers, that there are rules for teachers to follow and apply, do not fit in a classroom because it is a complex system which is uncertain and emergent. Many factors combine and work together to shape the performance of teaching practice. Teachers' early experience, personal qualities, and pre-service teacher education are all included in the milieu of classroom teaching and learning. Teachers' performances within the classroom and school environment are a subconscious negotiation with, and navigation of, the various elements they encounter in their immediate teaching environment. This is no kind of easy enactment. For a student teacher, many of these negotiations may be masked or made invisible by the associate teacher.

The key issue is that students struggle to see the relevance of the knowledge taught in the university setting. They do not see this 'enacted' because it tends to be too generalised and disconnected from the decision-making teachers do on a daily basis. They want examples and support to see how this knowledge applies and can be used in a pragmatic way. What teacher education tries to do in pre-service teacher education is to overcome many of these, or give the student teachers resilience to go into a class and minimise that induction shock or the disequilibrium. Initial teacher education attempts to smooth the transition for the student teachers and enable them to enter the profession with more confidence and competence.

iii. The problem of complexity

The problem of complexity is all about accommodating the complexity of education phenomena. It is an approach to understanding the complexity discussed above. Schools are highly complex settings that are potentially chaotic given the diversity of elements in play. McDonald (1992) suggested that there is a wild triangle of relations within teaching among teacher, student, and subject. Lampert (2001) elaborates further that this wild triangle is

constantly shifting, which means there is no routine to be followed by teachers. Furthermore, teachers have to consider multiple problems, simultaneously in a complex practice, including achieving multiple teaching goals, building relationship with diverse groups of students, and mastering comprehensive kinds of knowledge. Glouberman and Zimmerman (2002) also argue that teaching is not as simple as following a recipe, nor as complicated as sending a rocket to the moon. Rather they argue that teaching is complex (see Table 2.1). Moreover, as Darling-Hammond (2006) added, what makes effective teaching more complex is that "teachers must learn how to maintain a healthy dialectic between the goals of teaching subject matter toward a common set of curriculum objectives and teaching students in ways that attend to their diverse interests, abilities, starting points, and pathways" (p. 40). Teacher education not only prepares student teachers for schooling as it should be (i.e. future-focused), but also enables them for schooling as it is currently, with all the pragmatic constraints (Darling-Hammond, 2006).

Table 2.1

Teaching as complex based on Glouberman and Zimmerman (2002)

Simple **Following a recipe**	**Complicated** **Sending a rocket to the moon**	**Complex** **Teaching**
Recipes are essential	Formulae are critical	Formulae have limited application
Recipes are easily replicated	Sending one rocket increases the assurance that the next will be OK	Teaching one class gives experience but no assurance of success with another
Expertise is helpful but not required	High levels of expertise in multiple fields needed	Expertise can contribute but is neither necessary nor sufficient for success
Produce a standardised product	Rockets are similar in critical ways	Each student is unique and must be approached individually
Best recipes give good results every time	High degree of certainty in outcome once the original issues are solved	Uncertainty of outcomes remains

One aspect of the problem of complexity is that not enough attention is given to how schools, as complex organisations, impact on beginning teacher transition and development. Zeichner (1983) conceptualises the act of becoming a teacher as a process of socialisation. Kuzmic (1994) asserts that 'organisational literacy' should be part of the teacher preparation

programme. Compared with researchers concentrating on problems associated with classroom management and teaching, fewer studies pay attention to the fact that beginning teachers also become members of an organisation. To either conform to or resist the prevailing culture, beginning teachers often experience 'the anguish of compromise' to 'fit in' (Khamis, 2000). Flores (2001) suggests that beginning teachers in supportive and informative settings are more likely to seek advice and to overcome difficulties. According to Darling-Hammond (1999), collaborative and collegial cultures have been identified as providing the most conducive conditions for starting to teach. Like Kuzmic (1994), Kelchtermans and Ballet (2002) also view teacher socialisation as a positive process between new teachers and the context.

Another aspect of the problem of complexity is the student teachers' ability to learn through trial and error, particularly as it pertains to the development of decision-making capabilities while situated in multiple complex systems. For example, in initial teacher education programs, student teachers are embedded within a wider complex system that governs particular ways of acting, knowing, and becoming teachers. Programs are shaped by the particular teacher landscape constructed for the student teacher in terms of whom they interact with, what experiences they are exposed to through how course work is delivered and practicum placements arranged, and through what assessment tasks are required of them. They navigate their way through numerous courses and pathways as they learn about teaching. There is a constant flow of ideas, responses, and information arising around issues and problems as student teachers, associate teachers, and teacher educators interact. Responding to the myriad of situations and problems that confront them on a daily basis necessitates flexible decision-making in the face of uncertainty and unknowns. This is the plight of a student teacher and is indeed true for all teachers. When failure is made viable and safe, student teachers can explore this complexity in ways that contribute to their professional decision-making abilities.

According to Russell's (2008) explanation, the second and third problems can also be caused by the first one. Though these important problems are divided into discrete aspects literally, they are connected deeply. Before student teachers enter the education programme, they have already spent thousands of hours as a student in schools, developing their tacit and unexamined ideas of good teaching. It is no wonder that student teachers may face the problem of enactment during practicum because this prior knowledge from the apprenticeship of observation of how teaching should look could not enable them to deal with the complexities of the teaching profession. Therefore, the problem of 'apprenticeship of observation' inspires us to think about the effectiveness of teacher education programmes on student teachers' prior knowledge. In

other words, how can teacher education challenge student teachers' tacit assumptions about teaching and learning? Taking technology into this consideration, how could student teachers become teachers with technology, and to what degree could teacher education help student teachers recognise and develop their understanding of technology use in teaching and learning?

To summarise the chapter to this point,

1. This study is about 'becoming teacher'. It frames learning to teach as a journey, not an endpoint resulting in the finished product. It is a journey in which the individual is, "always in the middle" (Deleuze & Guattari, 1988, p. 21) of a career and life trajectory.
2. The journey is mediated by prior knowledge (apprenticeship of observation), the problem of enactment and complexity.

2.3. Living in a Digital World

Technology is about using intellectual and practical resources to create technological outcomes. Technology is intervention by design, which expand human possibilities through addressing needs and enabling opportunities (Ministry of Education, 2017b). As technology becoming ubiquitous, it may no longer be obvious that technology is even being used. In this research, 'technology' works as a synecdoche to refer to the tools and methods used in the process of learning to teach, especially as the meaning of digital technologies, such as computers, iPads, or learning management systems, all could be taken as technologies. In this section, I firstly draw on the meaning of the key terms. Then I review the literature on the digital world and digital generation, which supports the importance and tendency of integrating technologies into teacher education.

a. Terminology

As technology develops in the educational setting, various terms are used in different contexts. In order to clarify the meaning and use of the terms, and to avoid ambiguity in this thesis, a list of vocabulary is explained below.

Digital technology: It refers to electronic or digital products and systems, which includes hardware, software, peripherals, and wiring.[4] Digital technologies is also a specialist domain

[4] https://elearning.tki.org.nz/Professional-learning/e-Learning-Planning-Framework/Glossary#D

addressed in the New Zealand Curriculum (Ministry of Education, 2017b), including five technological areas as computational thinking for digital technologies, designing and developing digital outcomes, designing and developing materials outcomes, designing and developing processed outcomes and design and visual communication.

E-Learning: E-Learning (Electronic Learning) is learning and teaching that is facilitated by or supported through the appropriate use of information and communication technologies. It covers a spectrum of activities from supported learning, face-to-face teaching in conjunction with e-Learning, known as blended learning, to learning entirely online. It can be self-paced and can occur in or out of the classroom, or at home.

ICT: Information Communication Technologies refer to all the technology-related devices used to communicate.[5]

Therefore, based on the New Zealand Curriculum (Ministry of Education, 2017b), e-Learning is about learning *with* technology while digital technology refers to learning *about* technology. In this thesis, I use the term *technology* in a broad sense to include digital devices, internet, and programmes involved in teaching and learning. This research aims to explore student teachers' unique e-Learning process.

b. Digital world

Technology in education has been evolving all the time. Teachers have always been interested in methods and tools used for teaching and learning. The effectiveness of learning and teaching depends on the teaching tools used in facilitating the process. Del Campo et al. (2012) studied technology's history within university education and its impact on teachers, students, and teaching methods. Their study included an analysis of teaching techniques chronologically, ranging from chalkboards in old traditional classes, projectors in the eighties, and presentation software in the nineties, to the video, electronic board, and network resources nowadays. Initially, teaching was restricted to being present in the classroom with a teacher and a few students. Teaching and access to information were limited to the physical boundaries of the classroom. From the earliest times, pedagogy was oriented around presenting information verbally, with very little technology or visual aids. As new technologies developed, such as blackboards and chalk, teachers could present information for the students to copy down and the students had to be able to read the teachers' writing. As technologies evolved, teachers then

[5] https://www.ero.govt.nz/publications/modern-new-zealand-learning-practice-glossary/glossary-a-z/glossary-i/

had access to the overhead projector and whiteboard. With an overhead projector, teachers could write with a finer felt tip pen on a transparency and project it up larger, onto the whiteboard or wall. Later on, data projectors had more display options than overhead projectors. They could connect with computers and display any images on the computer screen, such as text, graphics, and even videos, whereas with overhead projectors it was limited to what was written on the transparency. Nowadays, with easy access to the internet, education is surrounded by a digital world. Digital technologies, as a way of increasing the productivity of work and the outcome of teaching achievement, are emerging.

The important aspect here is not the increasing sophistication of the technology available to teachers, but what it affords to the teacher and the impact that it has on reconfiguring the nature of pedagogy. Distance teaching and online resources have enabled the learning and teaching process to happen in different places or at different times. The internet also displaces the teacher as the central source of information and challenges notions around what school students need to know and how learning occurs. Accompanied by the prosperity of technologies, various related terms arise, such as information communication technologies (ICT), e-Learning, mobile learning, *et cetera*. These evolving terms have been co-developing with the nature of knowledge, and teaching and learning. It used to be believed that knowledge is immutable, while with related technology, individuals could create knowledge such as on Wikipedia. Technology, knowledge, teaching, and learning are just co-evolving in education. If the stick and chalk can be seen as a kind of technology, the extent of the capability and skills of the projector and whiteboard could be seen as 1.0 technology–a substitution of the former technology. That said, the 2.0 technology is more than a replacement, and rather, the transformation of concepts, such as interactive online learning systems.

While technology affords a range of educational possibilities for teachers, there is not a standard definition for technology integration (Bebell et al., 2004). One definition proposed by the U.S. Department of Education was “the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools” (2002, p. 75). Others defined technology integration as teachers’ use and modification of traditional activities with technology (Hennessy et al., 2005). Wachira and Keengwe (2011) defined technology integration as “incorporating technology and technology-based practices into all aspects of teaching and learning specifically, incorporating appropriate technology in objectives, lessons, and assessment of learning outcomes” (p. 17). In the New Media Consortium (NMC) Horizon Project, “educational technology is defined in a broad sense as

tools and resources that are used to improve teaching, learning, and creative inquiry" (Johnson et al., 2015, p. 34). The term e-Learning explained in the New Zealand Ministry of Education's e-Learning action plan as "Learning and teaching that is facilitated by or supported through the smart use of information and communication technologies" (Ministry of Education, 2006, p. 2).

As Earl and Forbes (2008) suggested, the word 'communication' draws attention to how technologies are used for people's connection, which is the potential purpose of integrating technologies into education. 'Web 2.0' is the current state of internet development, with 'six big ideas' (Andersen, 2007) behind it, including user-generated content, the power of the crowd, data on an epic scale, architecture of participation, network effects, and openness. With Web 2.0, we also got pedagogy 2.0, and assessment 2.0. Therefore, integrating technology in education is more than just using digital devices in schools, which also indicates the transforming of pedagogies and philosophy.

It is obvious that to integrate digital technology into education is an inevitable trend. From the NMC Horizon Report, the key trends accelerating technology adoption in K-12 education have been divided into three movement-related categories, from short-term impact trends to long-term impact trends. According to this report, it is suggested that educational technologies like bring your own device (BYOD), maker spaces, 3D printing, adaptive learning technologies, digital badges, and wearable technology are important developments likely influencing technology planning and decision-making for the next five years. Obviously, digital technology will be more and more commonplace in education in the near future.

The integration of digital technology and education is a global trend. Because of the declining cost, digital devices are becoming more affordable, making it realistic to integrate technology into daily teaching and learning. Because of the decreasing cost and increased access to wireless internet, learners from around the world can build relationships beyond the classroom to information sources, support networks, and other learners. Due to these global trends, many governments across the world have invested heavily in the infrastructure and taken a series of initiatives to ensure education is well resourced. For example, the New Zealand government had, as an objective, to provide 97.7% of schools and 99.9% of learners with access to ultra-fast broadband capability by June 2016. It also has a strategic objective to ensure that schools can take full advantage of 21st-century learning methods and that learners are well-prepared to work with new technologies. In comparison, the Ministry of Education of the People's

Republic of China had, as a core objective, to achieve an internet access rate of 95% for all national primary and secondary schools by 2016. The American government has also invested large sums of money to equip classrooms with technology (Culp et al., 2005; Dickard, 2003). According to the United States Department of Education, almost 100% of schools had internet access by 2010.

Early research noted a lack of technology use in education (CEO Forum, 2000; Moursund & Bielefeldt, 1999), but the situation has now changed and with an increasing focus on its use and value. However, teachers and students' use of technology seems to have remained at lower levels (Brown & Warschauer, 2006; Puentedura, 2013; Russell et al., 2003; Swain, 2006), which indicates a traditional, teacher-centred instruction mode. Nowadays, digital technologies afford more learning opportunities as teachers and students engage more in online, digital environments (Heflin et al., 2017; McKnight et al., 2016) and as faculties change educational practices through a wide array of innovative, engaging learning strategies (Fathema et al., 2015; Kopcha et al., 2016). The traditional teacher-centred instruction model limits students' own regulation of learning with technology or student-centred approaches (Sang et al., 2010). It is reported that teachers who use technology routinely in their classrooms are more likely to be attuned to students' learning needs, and interaction and collaboration are more likely to happen (Ham, 2009; Johnson et al., 2010; OECD, 2005a). However, it is worth noting Dillenbourg (2008) caution that digital technologies integrated with education do not necessarily predict learning outcomes. Instead, it is how teachers use the affordances provided by technology that impacts most significantly on student learning. What matters, is not that technology is integrated into the classroom, but what learning that of the technology enables.

c. Digital generation (subjectivity)

The relationship of the digital generation–young people living in the digital world–and technology is complex. Labels such as 'Digital natives' (Prensky, 2001) or the 'Net generation' (Tapscott, 1998) are used to describe the generation who are familiar with and relied on information and communication technology (ICT). Despite this generation now being of university age, there are concerns that, students entering Schools of Education lack of enough technology skills (Banister & Vannatta, 2006; Cunningham, 2004; Harnisch, 2002). Pearson (2018) conducted research on the Net generation by comparing the outlook and values of Generation Z (GenZ) with Millennials'. The results reflected that GenZ was more likely to be excited by risk-taking than their Millennial counterparts. As for their experiences in education,

GenZ demonstrated more current online behaviours. GenZ had been so immersed in technology in every aspect of their lives that they take technology for granted as a normal, integral part of life rather than a transformative phenomenon. Though GenZ embraced technology, they still value 'traditional' methods of instruction such as printed materials and teacher interactions. Besides friends, mentors, and co-workers; educators and parents had the most significant impact on learning and personal development, regardless of age.

Contrasting this simple classification by date of birth and uniformity among young people, some researchers indicate that maybe "there is as much variation within the digital native generation as between the generations" (Bennett et al., 2008, p. 779). "More than assuming that all young people are digital natives or part of the Net Generation" (p. 4), and "more than simply integrating technology into teaching" (p. 3-4), Ovens and Garbett (2015) suggest that attention should be paid to "how technology contributes to an inclusive, participatory, and personalised learning culture for students" (p. 4). Bennett et al. (2008) commented that the digital native's debate could be likened to an academic 'moral panic' with dramatic arguments and limited empirical evidence. They suggested that rather than simply dividing the young people into digital natives, the relationship between young people and technology was much more complex. What should be noted is that some young people, but definitely not all, can be proficient–even expert–at using digital technologies for some purposes, but again, not all. For example, a young person may be proficient using technology for social networking but not able to support their formal learning through its use. Therefore, it is possible that one can be a fantastic social user, but have almost no skills to be able to use technology to help with formal learning.

In addressing this concern, various policy documents (for example, Ministry of Education, 2006) focus on enabling the learner to be a proficient e-Learner. It is stated that "today's students need to be confident and capable users of ICT and to understand how to use ICT effectively across the curriculum" (Ministry of Education, 2006, p. 8). The New Zealand Curriculum also outlines that e-Learning can contribute to the development of the key competencies in ICT-rich contexts. For instance, e-Learning may assist the making of connections by enabling students to explore new learning environments, overcoming barriers of distance and time.

2.4. Digital Technologies as Affordances and Constraints in Education

As elaborated above, integration of digital technologies into education is inevitable and important. Technology is an 'enabling constraint' (Davis et al., 2015) in the student teachers' journeys of learning and teaching. An enabling constraint is a perceived element that constrains possible actions, while simultaneously creating imaginative and unanticipated affordances. The following section further discusses technology as both an affordance and constraint in education.

a. Affordances of integrating technology into education

Affordance, a term coined by Gibson (1979) from his ecological theory of perception, implies "the complementarity of the animal and the environment" (Gibson, 1979, p. 127). The term 'educational affordances' refers to "the relationships between the properties of an educational intervention and the characteristics of the learner that enable certain kinds of learning to take place" (McLoughlin & Lee, 2007, p. 666). In other words, an affordance is a relational property between some 'thing' and the way it enables an individual to achieve their goal. For instance, Anderson (2004) suggested that "the greatest affordance of the Web for educational use is the profound and multifaceted increase in communication and interaction capability" (p. 42).

Social software tools, such as blogs and wikis as pedagogical tools, also provide affordances with sharing, communication, and information discovery (Mcloughlin & Lee, 2007). Connectivity and social rapport, collaborative information discovery and sharing, content creation, knowledge and information aggregation, and content modification, are some examples of the affordances provided by social software tools (Mcloughlin & Lee, 2007). However, these educational affordances are not enough for guaranteeing effective learning.

Cox and Webb (2004) suggested that the relationship between the ways in which ICT was used and the attainment outcomes was significant, according to their review of studies conducted in different subjects in primary and secondary education. However, their review did not report any research from the early childhood education sector. There are indications that with the use of ICT in learning and teaching, what indeed matters is the teachers and their pedagogical approaches (Webb, 2005). It is not enough to just regard technologies as tools that teachers could use–it is also the pedagogies and concepts behind the reasons to use the tools that make sense. Adding technology as a tool without understanding the reasons behind using the tools and appropriate pedagogical approaches makes no sense.

Whether using technology during teaching is a wise choice or not needs to be further considered. Some research indicates that the answer to this question is positive. Pierce and Stacey (2010) suggested that technology is an agent that offers opportunities for educational transformation in curriculum, assessment, and pedagogy. For instance, digital technology may change the "learning of pen-and-paper skills; investigation of real world data; exploration of regularity and variation; simulation of real situations; and the linking of representations" (Geiger et al., 2016, p. 257). Some researchers also claimed an aspect of affordances of detailed software in a specific context (Goodwin & Gould, 2014; Yeh, 2013). Overall, "the deployment of ICT tools for learning must be underpinned by an explicit learning paradigm and informed by pedagogies that support learner self-direction and knowledge creation" (Mcloughlin & Lee, 2007, p. 667).

b. Barriers to integrating technology into education

Though digital technology already permeates every corner of society, integrating technology within education still faces many obstacles. According to the Walden University's report (Riley, 2010), the lack of adequate digital skills started at the initial teacher education stage which provides them with no technology, nor 21st-century skills. Moreover, post-service training emphasised how to use digital devices rather than how to incorporate them into teaching effectively. Some researchers found that the lack of training and teachers' attitudes towards the value of technology were two important influential obstacles in technology integration (Bingimlas, 2009; Buabeng-Andoh, 2012). Some common barriers reported were a lack of equipment for digital learning, insufficient assistance for teachers' technology use, inadequate competence and pedagogical models, and vague objectives for using technology. Based on the NMC Horizon Report, one of the significant challenges impeding technology adoption in K-12 education is integrating technology into teacher education, which was considered a solvable challenge in the report. Accordingly, governments invested and took initiatives to improve teachers' digital skills and support students' learning using educational technology tools, such as American ConnectED program. University pre-service teacher education programs also emphasised the importance of digital education.

c. Teacher modelling

Teacher educators' teaching approaches with digital technology form the 'technological modelling' for their student teachers. If teacher educators have the experience and knowledge to integrate technology into their teaching, pre-service teachers are equipped with more

opportunities to teach technologically in their practice. Based on Mills' (2014) study, student teachers who studied using faculty-mediated Twitter chats were more likely to continue following the Twitter account as "an informal professional development medium" (p. 461) to learn about classroom resources and strategies. This Twitter activity helped student teachers to use Twitter as a connection to teachers and to continue their own professional learning (Nussbaum-Beach & Hall, 2012; Ricoy & Feliz, 2016). This professional use of Twitter could eventually inspire connected learning activities in the classroom with children (Hughes et al., 2015; Krueger, 2013; Schulten, 2013).

d. Digital technologies in early childhood education

Digital technologies already affect the people and environments that surround young children's learning (Siraj-Blatchford & Siraj-Blatchford, 2003). However, the extent of its potential is subject to debate from different perspectives. For example, Bolstad (2004) claimed that technologies offered opportunities and potential in early childhood education which included "opportunities to support and enhance children's learning and play experience; opportunities to support and strengthen practitioners' professional learning and development; and opportunities to support and strengthen relationships and communication between early childhood centres, parents, and other people connected to the early childhood education setting" (p. 2-3). This example is contradicted by the Alliance for Childhood (2000) and Monke (2006), expressing their concern that technologies hindered children's direct experiences of physical and social activities. However, Alliance for Childhood (2004) later acknowledged that technologies were here to stay and that new thinking around respect for, and critique of, technology was needed.

Contrary to claims that technologies isolated children, some researchers (Lee & O'Rourke, 2006; O'Hara, 2008; Stephen & Plowman, 2003) found that its inclusion stimulated social interaction, oral language, and peer tutoring because children naturally prefer to work together. Bilingual children, especially, could access support from a computer since it provided a shared focus for children who spoke different languages (Stephen & Plowman, 2003).

Previously, the policy and curriculum support for the development of technologies in the early childhood education sector was behind the school sector (O'Hara, 2004; Sheridan & Samuelsson, 2003; Stephen & Plowman, 2003). This situation has changed in the New Zealand context. Policy and curriculum support for the application of technologies is now across the whole education sector (Ministry of Education, 2006). The Foundations for Discovery

(Ministry of Education, 2005) framework is designed to guide the effective use and investment of technology in ECE. Rather than set expectations regarding the amount of ICT that centres should be equipped with, this framework emphasises guiding the pedagogical and administrative application of ICT.

Yelland et al. (2000) suggested that it was essential for initial teacher education students to use technologies to acquire new knowledge and to interact with others. Effective professional development supports teachers to develop understandings of technologies that connect with their philosophy and pedagogical views. Rather than perpetuate existing pedagogical strategies, teacher educators should "extend teaching and learning contexts in new and dynamic ways" (Yelland et al., 2000, p. 95) to better integrate technologies in teaching and learning.

Researchers studied that early childhood education teachers' beliefs were important to integrate technology into teaching (Blackwell et al., 2014; Chen & Chang, 2006; Keengwe & Onchwari, 2009). Laffey (2003) explored two pre-service teachers' perceptions and experiences at an American College of Education, finding that pre-service teachers' views about technology were influenced by seeing the engagement of children with technology. Therefore, based on the previous research, student teachers' beliefs and practice of using technology interacted on each other.

There is a growing focus on teachers using technology with children (Brooker, 2003; Nikolopoulou & Gialamas, 2015). Studies on technology use in early childhood education settings are common. However, research on student teachers' usage of technologies in early childhood teacher education is limited (Snell et al., 2019; Voogt & McKenney, 2017). Previous research reported that student teachers in early childhood education generally had less technology training than those in primary or secondary teacher education (Blackwell et al., 2015). My research, focused on Chinese student teachers in a one-year teacher education programme, could enrich the literature on international student teachers' learning journeys in a New Zealand educational context.

e. Core competencies for teachers

Teachers' core competencies of using technologies are an enabling constraint. When they develop these core competencies, they can better apply the technologies into their teaching; while if they do not have the competencies, it constrains their usage of the technologies. The Media and Information Literacy Curriculum for teachers–MIL (Wilson et al., 2011) and the

European Framework for the Digital Competence of Educators–DigCompEdu (Redecker & Punie, 2017) are two widespread frameworks for explaining the competencies that teachers need in a digital world. The MIL framework divides teachers' competencies into seven categories which are further subdivided into 45 outcomes, while the DigCompEdu framework categorises six areas into 22 nuanced competencies. By comparing these two frameworks, Araújo et al. (2020) identify five categories to address teachers' digital competencies (Table 2.2).

Table 2.2

Competencies' thematic categories

	DIGITAL COMPETENCE OF EDUCATORS (JRC/EU)	MEDIA AND INFORMATION LITERACY COMPETENCIES (UNESCO)	Category definition
Understanding and uses of technologies	1. Using digital technologies for communication, collaboration and professional development.	3. Accessing Information Effectively and Efficiently	To use digital technologies to access information, communicate, collaborate or professional development. To know identify and select information and describe criteria used.
Selection and critical management of contents and resources	2. Sourcing, creating and sharing digital resources.	2. Understanding Media Content and Its Uses 4. Critically Evaluating Information and Information Sources	Identify and select digital resources, comparing information and using many criteria to evaluate it. Different strategies to recognise cultural and social context as values to interpreted media (prejudice, manipulation). To organise, manage, protect, create and modify digital content. Identify, interpret and analyse critically stereotypes, representation and values projected by media.
Technology' uses in the didactic field	3. Managing and orchestrating the use of digital technologies in teaching and learning; 4.Using digital technologies and strategies to enhance assessment.	5. Applying New and Traditional Media Formats	To use both digital and traditional devices in teaching process for interaction and collaboration learners (within and outside the learning session) or as a tool to planning, to make assessments, to give feedback or to support learners express his/her own ideas.
Pedagogical Aspects' Promotion	5. Using digital technologies to enhance inclusion, personalisation and learners' active engagement.	7. Promoting MIL Among Students and Managing Required Changes	To use different kinds of media and technology respecting the variety of students' skills, experiences and backgrounds. To ensure accessibility to learning for all. To promote learners' active and creative engagement, helping them to improve their media and information literacy.
Responsible and democratic uses of media and technology	6. Enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing	1. Understanding the Role of Media and Information in Democracy 6. Situating the Sociocultural Context of Media Content	Identify credibility and reliability of information, as well as the media pluralism and editorial independence. The relationship between Democracy, citizenship,

and problem-solving.	media and information literacy, and Human Rights. How copyright and licenses are applied to digital content. To manage risks and use digital technologies safely and responsibly to civic participation.

Explaining these competencies also provides lenses for exploring the impact of technologies on becoming teachers and the affordance that technologies provide. The two sub-questions of this research, how student teachers use technology as a tool for their own learning, and how student teachers use technology for giving instructions during their practicum experiences, can be answered together, combining with student teachers' competencies in using technologies.

Cultural capability in technology is critical in the New Zealand Curriculum (Ministry of Education, 2017b), which is based on understanding that the education system has underperformed for Māori learners and their whānau over an extended period. This could also apply to international learners. Cultural capability is about understanding, valuing, and amplifying different world views, perspectives, experiences, and measures of success. Culturally capable teachers are required to recognise the diversity of identities, including culture, gender, sexuality, and ability. They are supposed to take action to amplify the views of those and their communities who have been marginalised. Mishra and Koehler's (2006) TPACK framework, focuses on technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK), and offers a productive framework to understand and describe the kinds of knowledge needed by a teacher for effective pedagogical practice in a technology-enhanced learning environment. However, it could be problematised as leaving out many of the socio-cultural factors which are important in 'becoming teacher'.

2.5. Chinese Students

New Zealand is a developed country and ranks highly in international comparisons of national performances, such as quality of life, health, and education.[6] According to The Economist (2019), New Zealand ranked third out of 50 economies in providing future-skills education. International education, as an important export industry, makes a significant economic and cultural contribution to New Zealand. In the past 25 years, international education has

[6] https://en.wikipedia.org/wiki/New_Zealand

developed to become the second-largest services export sector after tourism (New Zealand Government, 2018). International students make up 16% of the New Zealand student population–double the OECD average. In particular, New Zealand had the highest proportion of diploma-level students who were international (21%) (OECD, 2014). Nearly half of the international students at New Zealand tertiary institutions are from either China (28%) or India (18%) (OECD, 2014). Notably, Statistics New Zealand's 2013 Census recorded 23,580 people as having worked as ECE teachers in March 2013. The 2013 Census showed that three-quarters of ECE teachers are European. The next largest ethnic group are Māori teachers (14%), closely followed by Asian teachers (12%). While most ECE teachers are European, their proportion to Asian teachers is higher than for the general working population and for teachers in the other education sectors (Statistics New Zealand, 2013).

The number of students studying abroad is proliferating because of the main source countries' growth in household wealth, increased demand for higher education, low education capacity (in some countries), and growth in interest in studying abroad (Böhm et al., 2002). The Chinese ethnic group is a growing presence in New Zealand, from 105,057 in 2001, 147,567 in 2006, to 171,411 in 2013, which is 4.3 per cent of people that stated an ethnic group, living in New Zealand on 5 March, 2013 (Statistics New Zealand, 2013). This extends to the recruitment of Chinese students to early childhood centres and tertiary programmes.

There were large increases in the number of people able to hold a conversation about everyday things in Northern Chinese (including Mandarin), which was the fourth most common language spoken in New Zealand in 2013, while the other five were English, te reo Māori, Samoan, Hindi, and French. The number of people who could speak Northern Chinese (including Mandarin) almost doubled between 2001 and 2013, from 26,514 in 2001, to 41,391 in 2006, and reaching 52,263 people in 2013, which accounted for 1.3 per cent of people who knew more than one language. For young children who live in New Zealand with multicultural backgrounds, especially the Mandarin-speaking children, it may be beneficial to have Chinese role model teachers.

In view of the facts mentioned above, Chinese students in New Zealand is an important topic to be discussed.

a. Understanding Chinese learners' culture

Understanding Chinese students' experiences and the way they learn in class has been a research topic of interest in recent years. Chinese students have been stereotyped as rote learners who are passive in class, obedient to authority, and lacking the capacity for critical thinking (Atkinson, 1997; Ballard & Clanchy, 1991; Carson, 1992; Flowerdew, 1998; Fox, 1994; Liu, 1998). Some researchers have characterised the passive Chinese students as rote learners being determined by their Confucian heritage (Hu, 2002; Nelson, 1995; Oxford, 1995). Dispelling these common misconceptions, Watkins and Biggs (1996) coined the term 'Chinese learner' referring to Chinese students who are influenced by Confucian-heritage culture and explained new understandings about Confucian beliefs.

Confucianism is a system of thought and behaviour originating in ancient China. Confucian values emphasise academic achievement, the belief in effort, and the importance of education for personal improvement (Lee, 1996; Li, 2003). Along with other researchers, such as Chan (1997) and Jones (1999), Watkins and Biggs (2001) construct Chinese learners in a more positive way as valuing active and reflective thinking, open-mindedness, and a spirit of inquiry.

The above discourses follow a 'large culture' approach (Holliday, 1999) which assumes that a homogeneous national culture substantially determines personal behaviour. For example, what makes Chinese students as they are is a shared cultural heritage rooted in Confucianism. However, besides the 'large culture' factor, other factors such as social, political, and economic changes should also be discussed. Clark and Gieve (2006) propose to focus on 'small culture' explanations for the behaviours of Chinese learners abroad based on post-structuralist, critical pedagogy, and cultural studies perspectives. They claim that the influence of 'large culture' on individual values and behaviour is moderated or disrupted as the individual is immersed in a different context.

In this research, the three Mandarin-speaking students share a similar 'large culture'. However, understanding of their experiences should not be based on reified, abstracted, and frozen conceptions of culture. The individual students are always connecting with the contexts around them and negotiating with others in the class.

b. Challenges of Chinese students in New Zealand

Studying abroad is a challenge for international students since they experience many challenges when adjusting to the academic expectations and new social contexts, as well as adjusting

psychologically (Church, 1982; Pritchard, 2011; Toyokawa & Toyokawa, 2002; Ward & Kennedy, 1993). Chinese students, similar to other international students, are reported to experience the above difficulties (Pan et al., 2008; Sun & Chen, 1999). They are observed to struggle with mastering the English language, interacting with host peers and faculty members (Spencer-Oatey & Xiong, 2006; Swagler & Ellis, 2003; Yan & Berliner, 2009), and experiencing mental health issues such as depression and anxiety (Chen & Bennett, 2012; Ellis-Bosold & Thornton-Orr, 2013). The language difficulty is frequently mentioned in the literature (Pan et al., 2008). More than simply mastering a new language, lack of language proficiency prohibits the Chinese students' participation in classroom discussions and intercultural communication which has further detrimental effects on their academic performances and social lives (Pan et al., 2008).

Lee et al. (2013) explored the academic difficulties encountered by East Asian students (60% of the surveyed participants were Chinese) in New Zealand. They found that difficulties with academic content, such as the ability to manage academic workloads, studying in a different educational system, completing assignments on time, and making oral presentations, appeared to act as the major barrier to the students' academic performance, rather than the English language. Campbell and Li (2008) investigated 22 Asian students' (with Mainland Chinese being the dominant group) learning experiences in New Zealand, finding that they experienced "difficulties deriving from lack of knowledge of academic norms and conventions, insufficient learning support, unfamiliar teaching methods, and cultural differences in classroom interactions" (p. 379).

Besides educational experiences, such as learning goals, language adaptation, and educational achievements, Zhang and Brunton (2007) also explored students' sociocultural experiences related to their experiences of accommodation, host country relations, and leisure activities by studying 140 Chinese international students enrolled in different educational institutions in Auckland, New Zealand. The results showed that recognition of the influence of sociocultural factors, beyond the learning experience itself, is vital in facilitating mutually beneficial outcomes for Chinese international students in New Zealand.

The aforementioned studies discussing students' difficulties and adjustments might involuntarily perpetuate a deficit view that they are problematic and needy. It is important to move from the mindset of *deficit* view to a *difference* view of international students (Fox, 1994; Kennedy, 2002) to explore their dynamic developments in their learning journeys. This

research, investigating three Mandarin-speaking Chinese students' complex learning journeys across a one-year programme, illustrates these students' individual lived experiences in their contexts and personalises these common experiences of being strangers in a strange land.

The previous research related to Chinese students in the New Zealand context was mainly on a cross-faculty or cross-university level. For example, Zhang and Brunton's (2007) participants were enrolled in a cross-section of five different institutions of higher education (including a university, a polytechnic, a private tertiary language school, and another institution) in Auckland and Lee et al.'s (2013) study focused on different subjects in one university. In order to deepen the understanding of a specific group of Chinese students, this research focuses on the early childhood education postgraduate student teachers' becoming journeys. This could also help fill the gap in the lack of research on initial teacher education in international students' learning journeys.

In summary, complexity thinking is the underpinning philosophical framework for the study. This study is about 'becoming teacher', which is mediated by prior knowledge (apprenticeship of observation), the problem of enactment and complexity. Technology is an 'enabling constraint' in the student teachers' journeys of learning and teaching. The research gap is in the lack of research on student teachers' usage of technologies in early childhood teacher education and that the study of initial teacher education in international students' learning journeys is limited. This informs the practice of Chinese students' learning journeys with technology in teacher education in the New Zealand context, shifting from a *deficit* view to a *difference* view of international students.

Chapter 3. Research Methodology

The philosophical assumptions that frame this research assume the world is complex, and care must be exercised to accommodate both the constituent elements and the socio-politico-material networks they create through their relationality. Such assumptions draw from a range of theories about complexity and view the process of learning to teach as a complex, emergent process of becoming, rather than a complicated process of achieving some finalised endpoint. This complexity world view is not only reflected in the ontological assumptions framing the research, but also embodied in the methodology of the research process itself. A variety of methods are adopted to explore the emerging complexities in the journey of learning to teach.

This chapter is divided into three sections. The first section outlines bricolage (Kincheloe, 2001) as the methodology used in this research. The second section focuses on the data-generation process, including the outline of the participants and the methods used to generate data. The third section focuses on the data analysis and representation processes.

This research aims to explore the complex journey of learning to teach which is evolving, flexible, unpredictable, and always changing. Conducted through a variety of methods with multiple participants of different genders and ages, the data, analysed from different points of view, add quality and credibility to the research.

3.1. Bricolage

In order to study the emerging process of learning to teach, I utilise bricolage to guide the investigative process. Etymologically, bricolage comes from a traditional French expression ‘bricoleur’, referring to the craftspeople who creatively make use of the tools and materials at hand to construct new artefacts or complete a task (Levi-Strauss, 1966; Kincheloe, 2001). The origins of bricolage research stem from the works of the anthropologist Claude Levi-Strauss (1966), who uses the bricolage metaphor as a way to generally create meaning within the context of structuralism. Later scholars (for example, Berry, 2004; Denzin & Lincoln, 1999; Kincheloe, 2001; Rogers, 2012) see bricolage as more grounded in the context of post-structuralism, where it is described as a critical research praxis challenging positivist paradigms.

Bricolage, in the way that I am using it, can be considered as a critical, multi-perspectival, multi-theoretical, and multi-methodological approach to the inquiry (Denzin & Lincoln, 1999). It is also coherent with the complexity framework, accommodating my need to capture the different nuances involved in conceptualising a multidimensional reality.

Bricolage adopts an emergent realist position, which assumes that the object of inquiry does not exist independently from the network of relationships that produce it as an entity for analysis. For example, as Rogers (2012) suggests, "Ontologically, bricoleurs examine how socio-historical dynamics influence and shape an object of inquiry" (p. 10). In a similar way, Kincheloe (2005) argues that, in bricolage, the object of inquiry is always a part of many contexts and processes. Adopting a bricolage approach can help researchers accommodate the complexity of meaning-making processes and recognise the contradictions of the world (Rogers, 2012).

Bricolage, epistemologically, is a non-representational approach to developing knowledge around a topic (Rogers, 2012). Compared to a representational approach, that aims to provide an account that corresponds closely to an assumed unwavering and fixed world, non-representational approaches aim to provide an account that brings the world into existence through connection and participation. As Doel (1999) wrote, the painter's task is not to paint or represent an object but to activate that object's essence for another. Vannini (2015) suggests that what is unique about a non-representational approach is an issue of 'style'. What is different is the orientation to 'data'. For him, non-representationalists "are much less interested in representing an empirical reality that has taken place *before* the act of representation than they are in enacting multiple and diverse potentials of what knowledge can become *afterwards*" (p.12).

Given the assumption in this study is that the journey of learning to teach is complex and emerging, the aim is to not to represent the essence of the journey in an objective sense, but to activate a sensitivity to the subjective essence of the journey for the reader. Therefore, I am approaching the data with a slightly different style to create a 'new' picture of possibilities because the data is not dependent on the historical events. 'Meaning' is a product of complex and dynamic interactions. I am trying to capture this fluidity. However, even in the process of capturing it, this fluidity is transformed into something fixed. Indeed, as Mol and Law (2002) commented, when you try to pin down something complex, you lose it. A sensitivity to complexity suggests a need to problematise how meaning becomes rendered from the empirical

materials collected in the course of a research study. Rather than using a representational epistemology of searching through data for what they reveal about an objective world, bricolage is more of a process of synthesising data to provoke readers to find more complex and creative ways of interacting with reality (Osberg et al., 2008).

Furthermore, bricolage makes it possible to use the methods at hand to help to capture different moments under various situations. The aim is not to develop certainty about a phenomenon, but rather create a representation of how phenomena may be enacted to create meaning. Kincheloe (2004) elaborates further, suggesting that bricolage is not an approach to achieving some final, transhistorical, non-ideological meaning, or acquiring a single 'truth'. Rather, through bricolage, researchers assemble the means to engage a dynamic inquiry process and bring forth a deeper understanding of the phenomenon.

Bricolage can be enacted in different ways. Wibberley (2012) uses a range of metaphors to describe the process of producing the bricolage including "weaving; sewing; quilting (both patchwork and embroidered); montage; and collage" (p. 6). He goes on to write that the fragments of data can be thought of as "either being drawn into an ordered whole (stained glass) or left disjointed and jarring against each other (smashed glass)" (p. 6). According to Denzin and Lincoln (1999), there are five types of bricoleurs: the interpretive bricoleur, the methodological bricoleur, the theoretical bricoleur, the political bricoleur, and the narrative bricoleur. I provide a brief summary of each below.

- **The interpretive bricoleur**. An interpretive bricoleur "understands that research is an interactive process, shaped by his or her own personal history, biography, gender, social class, race and ethnicity, and by those of the people in the setting" (Denzin & Lincoln, 1999, p. 6). As Finlay (2002) further explains, "Reflexive analysis in research encompasses continual evaluation of subjective responses, intersubjective dynamics, and the research process itself" (p. 532). Therefore, "reflexivity adds depth and plurality to the inquiry process" (Rogers, 2012, p. 4). Rather than remain a neutral observer in the research context, as a participant-observer, the researcher's positioning is also included and respected during the process of this research.

- **The methodological bricoleur**. A methodological bricoleur would combine multiple research tools to conduct the study. Through these creative, fluid, eclectic, and multiple analytical approaches, it would be better "to explore power networks

and broad ideological perspectives" (Wickens, 2011, p. 151), and to achieve deep, rich, and fluid analysis. Furthermore, to respect the complexity, contextual contingencies are allowed to be used in generating data, and tools 'at hand' are also widely used. In other words, bricolage is based on an emergent design. In this form, methods such as constant comparative analysis (Glaser & Strauss, 1967) and discursive textual analysis (Fairclough, 2003) are utilised.

- **The theoretical bricoleur.** As a theoretical bricoleur, the bricoleur works through multiple theoretical paradigms and uses a wide knowledge of social-theoretical perspectives to positions–from constructivism to critical constructivism, enactivism, critical theory, poststructuralism, and cultural studies. During this research, the researcher draws on complexity thinking (Davis & Sumara, 2006) to provide key theoretical resources to making sense of the data.

- **The political bricoleur.** No research process could escape from political implications. Political bricoleurs are aware of the connection between knowledge and power. In light of such awareness, bricoleurs attempt to document the effects of diverse power.

- **The narrative bricoleur.** Since the objective reality cannot be fully captured, a narrative bricoleur's inquiry is just a representation–a specific interpretation of a phenomenon. Rather than take the ideologies and discourses for granted, narrative bricoleurs tend to understand their influence on the research process. Therefore, rather than assuming a univocal positioning within this study, this research utilises a narrative bricolage approach to employ multiple fragmented voices derived from field notes, research journals, interview transcripts, and other documents.

While there are various types of bricoleurs, each of them can be enacted synchronously. For example, a bricoleur could be an interpretive bricoleur as well as a methodological bricoleur. As an interpretive bricoleur, the researcher's position is included and respected in the process of researching, and as a methodological bricoleur, emergent methods are utilised to conduct the study. At varying times, bricoleurs move between stances. During this research project, as a bricoleur, I take responsibility for, and acknowledge openly, my different roles.

Bricoleurs are, by necessity, part of the research. It is not possible for bricoleurs to be neutral, but requires the inclusion of their perception, subjectivity, and creativity. Their perception is

shaped by conditions and the power relations inherent in the context. A bricoleur's subjectivity influences the choice of study topic, the selecting of methodology, and the process of data analysis (Ratner, 2002). As a bricoleur, my perception is shaped by the traditional Chinese culture through my own learning journey. As a Mandarin-speaking doctoral student, I chose Mandarin-speaking students as my participants to explore their learning journeys, since we may share similar cultural backgrounds. In the analysis, discussion, and findings, the bricoleur creates a rich and nuanced understanding of the project by intertwining his or her own perception, subjectivity, and creativity. Rather than a 'finder', the bricoleur is a 'producer' or 'fabricator' of knowledge (Ovens & Fletcher, 2014). Throughout the research process, bricoleurs consider multiple ways to present and represent their developing understanding as well as to spark and generate ideas.

In summary, there are four key points about bricolage as a methodology that frames my approach. Firstly, bricolage is a methodology suited to studying the complexity of educational phenomena. As a multi-theoretical and multi-methodological approach, bricolage fits into a complexity framework and has enabled me to capture the nuances of the participants' different learning journeys. Secondly, bricolage assumes that the object of inquiry emerges from and is shaped by socio-historical dynamics and is always a part of many contexts and processes. There is no final, transhistorical, non-ideological meaning, nor a single truth to be discovered. Thirdly, as an epistemology, bricolage is a non-representational approach to developing knowledge around the object of inquiry. Fourthly, bricolage can be enacted in different ways. Rather than painting a realist picture of a given world, bricolage pieces together the information and explores the relationship and interaction with realities in more complex and creative ways.

3.2. Data Generation

In enacting a bricolage methodology, data were generated and synthesised in a variety of ways in order to increase sensitivity to, and understanding of, the learning journey process. Rather than assuming that there was a stable or absolute 'truth' or 'reality' waiting to be discovered, data were generated by the participants and the researcher through their experiences and perceptions of the world as well as through their relationships, built through the research process. Therefore, instead of 'collecting' data, I actively collaborated with the participants to generate data together. Bricolage is, as Denzin and Lincoln (1999) state, an interactive process.

As a bricoleur, I analysed, interpreted, and added to the data we generated. I am constantly aware of my position in the research as an interacting, dynamic agent of the process.

a. Research context

The national context for this research is New Zealand–a multi-cultural and diverse nation. As outlined in the review of literature, Asian is the third major ethnic group in New Zealand. In the 2013 census, 12% of people in New Zealand identified with at least one Asian ethnicity, an increase of 33% since 2006 (Statistics New Zealand, 2013). The Chinese ethnic group comprised 4.3% of the total population. The most common languages spoken by the Asian group living in New Zealand were English (83.7%) and Northern Chinese (including Mandarin) (14.3%). The most common region the Chinese ethnic group lived in was the Auckland Region (69%).

The institutional context is a Faculty of Education within a large university in the largest city in New Zealand–Auckland. The participants in this study are all from a one-year graduate diploma programme for early childhood education students. Table 3.1 illustrates the number of enrolled students in three teacher education programmes during the last three years. It includes international and domestic enrolled student figures. It is clear that there are more international students in the early childhood programme than in either the primary or secondary programmes. I targeted the early childhood programme for recruitment because more potential participants were studying early childhood education.

Table 3.1

Number of enrolled students of the diploma programme during the last three years

Enrolled students	2017		2018		2019	
	International	Domestic	International	Domestic	International	Domestic
Early childhood	11	30	10	18	14	20
Primary	3	83	7	126	7	125
Secondary	5	204	10	201	6	146

b. Participants

In order to explore the journey of student teachers and their understanding of technology use, participants were recruited from a university-based programme of one-year Graduate Diploma in Teaching (Early Childhood Education). Following Patton's (1990) advice, I was keen to work with participants who represented 'information-rich cases' from which the important issues could be explored. My selection was based on purposive sampling to obtain a group of participants who, on balance, met the following criteria:

- Have diverse proficiency with digital technologies. This was intended to ensure that there was a representation of the broad range of students who wanted to become teachers and were beginning the process of learning about the role and use of digital technologies in educational practice.
- Have diverse views on the value of digital technologies to educational practice. This was intended to ensure that participants had different views on how such technologies can be used to facilitate learning.
- Have proficiency with speaking Mandarin. This was intended to identify them as a special sub-group about which, comparatively, little research has explored. As a Mandarin-speaking bricoleur, I was in a prime position to use my own expertise to delve deeper into this. Also, this criterion enabled richer conversations to be held in the group and helped establish a more effective group affinity for the research project.
- Share a common timetable and set of classes. This allowed more efficient use of my time when doing participant observations and provided common free-time for focus group interviews.

In order to identify possible participants, I attended the Induction Day for the diploma programme. There, I met some of the Chinese students in the programme and was added to a Mandarin-speaking students' WeChat group. In addition to introducing my research project to them face-to-face, I also posted an invitation to participate in the study to the WeChat group. Four participants who matched the criteria above agreed to participate. One subsequently withdrew and their data is not included. Table 3.2 below outlines the names allocated to each, their age, and gender. A more detailed outline of each person and their learning journeys will be presented in the following chapter.

Table 3.2

Pseudonyms for the participants

Participant pseudonyms	Gender	Age[7]
Amy	Female	26
Ben	Male	31
Connie	Female	38

As a Mandarin-speaking, Chinese doctoral student studying in Auckland, I specifically recruited Mandarin-speaking student teachers to explore their learning journeys. I communicated with them in their first language, Mandarin, which was beneficial to construct a close relationship between the participants and the researcher and also enabled me to explore in more detail and with more ease than would have been the case if I have been researching across a language difference. Moreover, comparing with my own educational background studying with technology, the participants and I may share a similar culture. However, I anticipate that we have experienced entirely unique learning journeys. These similarities are the foundation on which to construct the common knowledge, while the differences stimulate curiosity to explore more complexities.

c. Sources of data

This study examines the lived experience of learning to teach with technology in the Graduate Diploma in Teaching (Early Childhood Education). As Brewer (2000) suggests, data generation methods are meant to capture the "social meanings and ordinary activities" (p. 10) of participants in naturally occurring settings. Multiple methods of data generation are utilised to facilitate a relationship that allows for a more personal and in-depth portrait of the participants and their context. This research utilises data from a range of sources to understand the journey of learning to teach for the participants. The data are varied in nature with surveys administered at the beginning of this research to acquire broad patterns of information about the cohort of people in the programme and observations, interviews, and document analysis used to generate more detailed information to help explore 'why', 'how', and 'what' questions,

[7] By the year of 2017, the interview date.

critical to understanding education phenomenon as complex, non-linear, and contextually situated.

Anonymous questionnaire (whole cohort)

In the first semester of their course of study, an anonymous questionnaire (see in Appendix A) was given to 30 student teachers in the programme to provide both the demographic information of this cohort of students as well as information on their digital skills and attitude and preference towards the use of educational technology. The aim was to gain some insight into the cohort of students. Questionnaires were sent out before the start of a class to all the attending student teachers. A total of 27 out of 30 (90%) valid questionnaires were returned after the class.

In addition to this background information about the whole cohort, three possible participants were identified and invited to participate in a more in-depth analysis of the experience of learning to teach. As a methodological bricoleur, I utilised various methods to explore these three Mandarin-speaking students' learning journeys. Four sources of data were used as described below.

i. Participant observation

I undertook participant observations to acquire an understanding of students' experiences of learning to teach and observe how they interacted in the classroom with technology. I did this by sitting in lectures and observing the participant students as they engaged in the pedagogy of teacher education. Through these participant observations, I was able to feel the atmosphere in the class and observe the presence of technology in the lecturer's repertoire. I was able to share the experience that the students were having and to contextualise the information that the participants shared with me. As a participant in the class, I appreciated and noticed things that could not be easily captured through other means, such as the sense of pressure of an assignment, the anxiety about being in a teaching role, the feelings of success, and friendship during the process. As a participant-observer, I utilised field notes and a research journal to record my observations. While my main focus was on the journey of student teachers and educational technology as enabling-constraints, the boundaries of the case were not fixed, but fluid and open.

To better map the landscape of this teacher education programme and to focus on the contribution of technology to learning to teach, the basic content of participant observations included the following aspects.

- **Settings.** To observe the social-material/physical assemblage of the course setting, including, for example, how the classroom was organised and arranged, and whether the student teachers sat in clusters or individually.
- **Tools.** To observe what and how tools were used in the course, such as digital devices (including computers and mobile phones), infrastructure (for example internet connectivity), data presentation, paper copies of tasks, whiteboard, *et cetera*.
- **Content.** To understand the ideas and content that were being discussed. This included my notes on what happened in each class, and what the students and lecturer were talking about.
- **Engagement/activities.** To observe what students actually did in their class. For example, did they sit and listen, did they write notes, did they talk to each other, did they do much work using devices, was technology use important or in the background?

One aim of these observations was to understand the patterns and routines of course life. How did the lecturer use the tools available to them? How was the content and framing of the ideas organised and taught? In order to study this, I attended the lectures and engaged with the content and students. At times, I joined in the activities, such as learning actions to songs and wrote my field notes after the lesson. At other times, I observed and recorded comments in my journal during the lesson. An example of the observation field notes is in Appendix B.

In total, I observed classes 17 times over five different courses, adding up to around 34 hours (Table 3.3). I could observe all the participants because they shared a common timetable and set of classes. Since the participants in most of the classes were arranged into groups, I usually sat in a group with, or near, my participants to observe and experience their engagement with the lesson. As an interpretive bricoleur, I assume I will interpret the situations differently to any, or each, of the student teachers themselves. As is the case with bricolage, the aim is not about capturing the 'truth' but rather acknowledge that we have all made different sense of these moments in all of its complexity and, as an interpretive bricoleur, it is my aim to represent this.

Table 3.3

Data generation by class observations (five courses, around 34 hours)

Course	Observation date	Times
Hauora	22.03.2017 23.03.2017	2 times about 4 hours
Learning Theories	22.03.2017 23.03.2017	2 times about 4 hours
The Arts	11.05.2017	1 time about 2 hours
Personal Pedagogy	24.07.2017	1 time about 2 hours
Te Ao Māori Early Childhood Education	31.07/07.08/14.08/21.08/ 04.09/18.09.2017	11 times about 22 hours

ii. Document analysis

In addition to the participant observations of the classroom activity, I also sought to analyse documents and artefacts generated as part of the course activity. These provided another point of entry into the understanding of how educational technology enabled or constrained the learning journey. Document analysis provided a means to assess the role that the Learning Management System (the University used the Canvas LMS platform) played in the course pedagogy, particularly in the way it enabled and constrained student learning activity. The aim was to better understand the role Canvas played in mediating student engagement with the course content, learning activities, and assignment work. To do this, I sourced and analysed a variety of documents, including:

- Five Canvas Analytics reports of the observed courses;
- The programme handbook and eight course plans;
- Twenty-seven reflections written by the students while on practicum (Submitted as part of the course assessment).

iii. Individual interviews

To acquire more in-depth information on student teachers' experiences and feelings, each participant was scheduled to be interviewed at three different points in the year. The first interview focused on the participants' biography and starting beliefs about teaching. Subsequent interviews were spaced out during the year and focused on their experience of the learning journey. In each interview, the participants were encouraged to share and discuss the elements and events they felt were significant for their learning. Near the end of the programme, in the final interview, I asked participants to map their journey as a diagram, which they then explained to me. This exercise helped provide a deeper appreciation of the experience for each individual.

The interviews were audiotaped and then transcribed. Because of the participants' busy schedule and their study pressure, the interviews were organised at a time that suited their availability. I used other methods, including emails and video calls, to add more richness to the data, following up comments in the interviews or simply touching base and keeping in contact. I also used informal interviews, such as spontaneous ten minutes of a conversation after the observation session and recorded notes and my reflections in my journal.

Table 3.4

Data generation by individual interviews (eight interviews, around 10 hours)

Interviewee	Gender	Age	Interview 1	Interview 2	Interview 3	Interview 4
Amy	female	26	22.03.2017 35 minutes 7015 words	05.05.2017 2h 10m 22526 words	07.08.2017 40 minutes 2592 words	28.10.2017 1h 20m 10591 words
Ben	male	31	21.04.2017 2h 30m 28611 words	02.08.2017 1 hour 8625 words		
Connie	female	38	18.05.2017 1 hour 9812 words	07.10.2017 1 hour 9522 words		

iv. Focus group interview

The focus group interview aims to interview participants with similar backgrounds and experiences about major influential issues (Patton, 1990). A virtual [focus] group, which included myself and the three participants, was set up through the application WeChat. It helped facilitate a beneficial relationship and sense of community for the project. It was also beneficial to understand inter-subjectivity through this focus group. The focus group interview was conducted at the end of the programme and lasted for around two hours. The participants talked with each other in Mandarin. The interview was recorded. During the focus group time, the participants reflected on their journeys of the one-year programme and discussed the influential factors on their journeys. I transcribed and translated germane areas of the focus group interview into 19,448 English words.

These different data sources were interlinked and intertwined (Figure 3.1). For example, observations sparked individual conversations; the interviews informed observations.

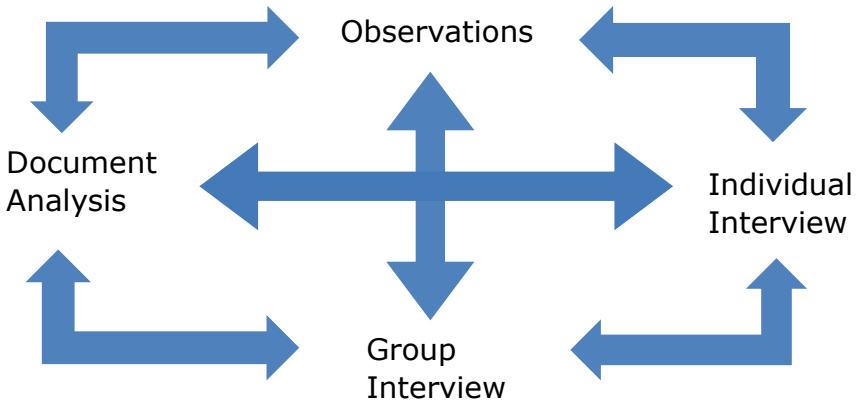

Figure 3.1. Diagram of methods design

3.3. Analysis of Data

Bricolage is a research process that follows an open, fluid, and flexible path. For Morin (2007), this suggests, epistemologically, that the method is done at the end. Similarly, Antonio Machado (1978) states poetically that, in the process of analysis, the path is made by walking.

Drawing on Madden's (2015) hiking metaphor mentioned earlier in the thesis, bricoleurs walk a certain path with a goal in mind but are flexible enough to work with the unexpected. It is a way of being attuned to the complexity of the participants' journeys. Kincheloe and Berry (2004) argue that, in bricolage, each journey will be different and proceed, seemingly, as a route of randomness. Analysis and interpretation are considered as partial and contingent, as there are no objective truths in terms of a phenomenon in this research perspective since the reality is emergent and dynamic.

a. Transcription and translation

This study was conducted in an English language context. The lectures were delivered in English and all the documents were written in English. Therefore, the observation and document analysis were conducted in English. Since the participants were Mandarin-speaking students, they were interviewed in Mandarin. The individual and focus group interviews were recorded and later transcribed, allowing the interviews to proceed unimpaired of note-taking, but with all information available later for full analysis. The interviews were conducted in Mandarin, then translated into English for doctoral thesis writing. The Google translate website was used to translate Mandarin into English. Since the translation was not perfect, I altered and modified the google translation to read more smoothly in English. Therefore, it was not a literal translation, but one that captures the meaning of the comments made.

It was important to reflect on the translation and interpretation research process. As a researcher and translator, I communicated with the participants in Mandarin and transcribed into Chinese, then analysed it in Chinese. I used the Google translate website to translate Chinese into English and only manually translated the excerpts of the transcript which would appear in the final thesis. In this way, the participants' original words could remain in their language as long as possible (Srivastava, 2006; Sutrisno et al., 2014) and I could apply my own cultural knowledge to interpreting the interview data. The translation process inevitably added another layer of complexity to the final findings. As a Chinese doctoral student and researcher focused on Mandarin-speaking student teachers' learning journeys, my subjectivity and their voices were entangled and woven together in the process of rendering their words as data.

b. Iterative analysis

Given that a complexity world view suggests that the researcher and researched are both parts of the phenomenon being researched, it means that it is not possible to obtain a neutral and detached position from which to observe the whole system in action. To address this, the

bricoleur uses multiple points of entry into the phenomenon being studied. The point of entry text (POET), could be anything that may make sense and generate meaning. In this project, the POETs were the empirical materials that had been generated as data for the study and analysis was an iterative process involving:

- **The initial reading of the POETs.** I read each data item ensuring it was complete, which provided some familiarity with the data.
- **The in-depth reading of each POET.** I carefully read each data item, annotating and noting any key ideas that emerged, from which I could draw and mark key meanings.
- **The construction of maps.** The themes were then used to construct a map of the ideas that were emerging from each POET. These data were mapped in an integrated manner, in an interpretation considering the context and their interpenetration. Thus, the 'strong' themes were reported in maps to help illustrate the patterns of relationships and meanings in ways that could be related back to the ideas of complexity and teacher education.
- **The in-depth construction of maps.** The fourth step was to compare the maps and identify the similarities and strengths. I looked for differences and items that did not fit and asked 'What is missing or not seen?', and 'How did I influence this interpretation?'. This step was similar to the method of constant comparison (Creswell, 2002) in which the data was coded to highlight particular themes and analytic memos were used to compare these themes to the literature and other data. It was a step where the emerging themes were revised constantly. If any data did not fit in these themes, the themes and coding were rethought.

In this analysis process, I was immersed in and entangled with the minutiae of the data. In more conventional methods, coding data required moving away from the data through generalisation and abstraction. In this case, however, the details enable the construction of a rich narrative. Instead of thinking under the metaphors such as 'tree', 'matrix', or 'table', MacLure (2013) suggested considering coding as the emerging construction of a 'cabinet of curiosities' or 'wonder cabinet' (p. 180). As for my research, it was like a 'cabinet of curiosities'. When I read the POETs, I would put the interesting pieces into the 'cabinet' to invoke particular

insights, but it was not supposed to be a coherent or total picture. The insights in the cabinet allowed me to enter into the journey of learning to teach and connect to it.

The analysis process stood as a synthesising process rather than a reductive one. I did not intend to organise the data into themes in order to analyse and draw a whole realistic picture of the learning journeys. I synthesised the data by bringing the pieces together in different ways to invite the reader to open a cabinet of curiosities and see a different story. For example, in Chapters 5, 6, and 7, I outline the daily routine timetables of the participants and describe their scenarios on campus. This was intended to capture and illustrate the flow of their everyday life in a non-representational way (Thrift, 2008). In Chapter 8, by constructing the map of constraints and enablers in student teachers' learning journeys and illustrating the fundamental problems in teacher education, I synthesised the data by weaving, sewing, and quilting. I expressed my developing understanding of the learning journeys according to my cabinet of curiosities. As an interpretive bricoleur, it is not possible for me to be neutral; and my position is included in the process of researching.

3.4. Limitations and Validity

As to the limitations of the methodology, it could be that as a larger pool of participants could generate different insights. While the number of participants in this research was limited, the intention in this study, was to develop rich, deep insights into the three participants, and generalizability was not a goal.

From a complexity perspective, the understanding of validity could shift form 'discovering the answer' to instead finding ways of interacting with the world. It is a quest of finding more complex and creative ways of interacting with our reality, which we can then use to interact in yet more complex and creative ways (Osberg et al., 2008). Therefore, rather than find the single truth, I am also a 'fabricator' of knowledge to spark readers' own ideas. Compared to a representational approach, rather than represent an empirical reality, this study, using non-representational approaches, aims to provide an account that brings the world into existence through connection and participation.

The validity of the study is achieved through the triangulation evident across multiple forms of data collection. As a methodological bricoleur, emergent methods are utilised to conduct the

study. Throughout the research process, I consider multiple ways to present and represent my developing understanding as well as to spark and generate ideas.

Chapter 4. Preface to the Learning Journey

In previous chapters, I have used the metaphor of a hiking trail to help illustrate the complexity of learning to teach. If I use that metaphor to describe this diploma programme, then the student teachers can be considered as individual hikers who have come together to walk an organised trail together. This chapter, as a point of entry for the reader into understanding the process, is more about providing some insights into the terrain that the students will be navigating. In a process similar to looking from a highpoint, the aim is to get a broad sense of the terrain for the hike. Chapter 4 provides an overview of how technology has become integrated into the organisational and pedagogical systems of the university. It also describes the pedagogies that the students experience. It does this by drawing on both my participant observations of the system and the questionnaire I gave to the student cohort. Individuals with different ages and backgrounds, from different locations, come and meet at a place of assembly to hike together. Although this hiking trail has a place of assembly, such as an Induction Day of the diploma programme, these hikers' journeys should not be seen as starting from that. The students/hikers arrive with a variety of backgrounds and experiences which will ultimately colour the sense that they make of the trail and influence the outcomes achieved. For some, who are inexperienced, everything may be overwhelming. For others who are more experienced, there may be more familiarity with the terrain, flora, and fauna.

What the hiking metaphor brings is a way of acknowledging that each individual begins their teacher education programme with different backgrounds, different orientations, different motivations, and different preparation, and while they would all meet together at the assembly point, the actual journey, experience, and endpoints would be very individual and different.

Hikers, in a defined area with a similar goal in mind, typically follow a map. This map may set out noteworthy markers and important places. There may be different coloured tracks denoting different grades or alternative routes that hikers may choose to take. In much the same way that a map serves a purpose to guide hikers, so too does the programme handbook which contextualises and structures the learning journey for student teachers.

4.1. Introduction to the Programme

This research was situated in a Graduate Diploma in Teaching (Early Childhood Education) programme. This qualification is firmly grounded in the national early childhood curriculum Te Whāriki (Ministry of Education, 2017a) and informed by the ERO report on Priorities for Children's Learning in Early Childhood Services (Education Review Office, 2013). It is an intensive programme equivalent to 1.25 years of full-time study, completed within 12 months, combining theory and practice. This qualification is available either full-time, over one extended academic year, or part-time, over two extended academic years. Student teachers enrolled in this programme are required to pass 150 points by studying ten, 15-point courses over two semesters.

Included in these ten courses, there are two practicum courses. The first 15-point practicum course consists of two blocks of practicum. Each block of the practicum is carried out in a different centre. The first block is for three weeks and the second one lasts for four weeks. The second practicum is a seven-week block placement in an early childhood centre. With an emphasis on practical experience, student teachers work alongside experienced teachers in a range of early childhood settings (Associate Teachers) and University staff (Professional Supervisors) during practicum placements.

The other eight courses vary from early years curriculum, learning theories, personal pedagogy, exploration, the arts, languages and cultures, Hauora,[8] and Māori early childhood education. The programme weaves together strands of pedagogy, subject matter knowledge, an awareness of context, and an understanding of learners, along with skills of critical reflection and analysis. According to the programme handbook, each course involves approximately 40 hours of face-to-face teaching and approximately 100 hours of self-directed study. During this process of learning, student teachers are expected to regularly interact with lecturers and other students face-to-face and also via the online learning management system.

This programme aims to equip the student teachers with the knowledge and skills to support young children, from birth to the age of five, to learn and to develop. Based on the programme handbook, through an evidence-informed, outcomes-focused, and inquiry-based approach, this programme aims to prepare student teachers to be able to teach diverse learners to enable

[8] Hauora is a Māori philosophy of health unique to New Zealand. It comprises taha tinana (physical well-being), taha hinengaro (mental and emotional well-being), taha whanau (social well-being), and taha wairua (spiritual well-being).

graduates to achieve positive and equitable outcomes for all children in Aotearoa. Student teachers are expected to be familiar with the New Zealand early childhood curriculum and effective teaching practice by the end of this programme. They will also be eligible to apply for provisional certification as a practising early childhood teacher.

The university is responsible for confirming that graduates meet 'satisfactory teacher' criteria for provisional registration by the Education Council to guarantee that the graduates are of good character and are fit to be teachers. The criteria, 'fit to be a teacher', means the graduates should maintain high standards of trustworthiness, honesty, reliability, sensitivity and compassion, respect for others, imagination, enthusiasm and dedication, communication, as well as physical and mental health (Education Council, 2017). Student teachers need to meet these standards by the completion of the programme and provide evidence of this requirement in a personal electronic portfolio. The portfolio is developed during the learning journey and will provide evidence of a student's professional learning and development process.

4.2. Entry into the Programme

Critical to the success of the programme is the calibre of students selected (OECD, 2005b). Student teachers applying for this programme are required to have completed an undergraduate degree at a recognised university (or similar institution) in any discipline with a Grade Point Equivalent (GPE) of 2.4. Entrance is subject to satisfactory police check/s, safety checks, interview, and referees' reports. Literacy and numeracy tests are also required. The three participants in the study were interviewed through Skype and asked questions such as why they were interested in the programme, what they know about early childhood teaching, and their prior experience of working in an early childhood centre or kindergarten in a New Zealand context. A panel to determine whether each applicant was fit to be a good teacher used these answers to inform their decision. The selected candidates are supposed to have and continue to develop appropriate dispositions such as being curious and open to learning, genuinely wanting to make a difference to educational inequalities, and demonstrate effective interpersonal skills, cultural competence and sensitivity to context, as well as having high academic abilities.

If the applicant is an international student whose first language is not English, he or she must provide evidence of English proficiency. To apply for this teaching programme, the international students are required to obtain a score with no bands less than 7.0, at a minimum,

in the International English Language Testing System (IELTS) academic test. In professional programmes, it is important that students have well-developed English language skills to meet the graduating standards of their particular programme. Consequently, all students in the faculty are required to complete the Diagnostic English Language Needs Assessment (DELNA) language requirements. As for the international students, particularly for those whose first language is not English, a good mastery of English is the basic criteria for applying for this teaching programme.

The three Mandarin-speaking Chinese student participants in this research had obviously spent considerable time developing their English skills. All of the participants studied English at school as it is compulsory for all children from the fourth grade until high school. College English is mainly offered to non-English majors as a required course in Chinese universities. Two of them, Ben and Connie, majored in English and learnt English intensively for at least four years in university, adding to the length of time that they studied English as a compulsory subject from primary school in China. The other interviewee, Amy, whose major was not English, came to New Zealand, then studied English intensively for more than a year to pass the IELTS test.

4.3. Induction Day

The programme began with the Induction Day on 23 January, 2017. The Induction Day is considered by the faculty to be the first official day of the programme and the first step in a career-long process of professional growth. On this day, student teachers were officially welcomed onto the campus with a pōwhiri[9] and met key faculty staff on the first day. They were then given instructions on how to access the programme handbook and curriculum documents. Both the hard copy and online version of the documents were offered to the student teachers. Staff from different departments explained the basic faculty services and discussed professional expectations and requirements of the students.

On the Induction Day, relationships were quickly formed. Based on my field notes, almost all the enrolled student teachers attended. It is not difficult for a Chinese student teacher to distinguish another Chinese student teacher. Since Ben was seated close to me on that day, we

[9] A pōwhiri is a Māori welcoming ceremony involving speeches, dancing, singing and finally the hongi.

introduced ourselves and began to talk. As Ben had been in New Zealand for only two days, he expressed how excited he was to see other Chinese students on the Induction Day. He felt secure in meeting compatriots in an unfamiliar country. He also actively greeted a Chinese student sitting next to him, who he then began talking to during the morning tea time. Three other Mandarin-speaking students, including Amy, joined them. I also joined their conversation. One of the students suggested that they set up a virtual group on WeChat where they could discuss issues and share ideas. The other four student teachers all expressed their agreement and delight to join the virtual group.

The WeChat application was chosen because this application is the most popular application among Chinese. It is practically a 'must-have', installed application for mobile phones. WeChat is a Chinese multi-purpose messaging, social media and mobile payment application developed by Tencent. WeChat was first released in 2011, and by 2018 it was one of the world's largest standalone mobile applications by monthly active users, with over 1 billion monthly active users. It has been called China's 'app for everything' and a 'super app' because of its wide range of functions and platforms.[10] These student teachers were all familiar with WeChat and appreciated the convenience of being able to communicate with other Chinese students through it.

Erica (pseudonym), the student who initiated the WeChat group, is actually a New Zealand citizen. Her parents are first-generation immigrants from China. While English is her first language, she speaks Cantonese with her parents and Mandarin with her friends. She wanted to create a WeChat group to connect with Chinese classmates. After she created the WeChat ECE group with Ben, Amy, and the other two students, Erica then continued to invite other Chinese students and absorbed them into the ECE group. Motivated by Erica, both Amy and Ben started to search for other Chinese students to join in their ECE group. Soon, Connie joined in through Erica. Then, Ben introduced another male student to the group. By the end of the first day of the ECE programme, there were as many as 12 Mandarin-speaking student teachers who had joined the WeChat ECE group. This number absolutely surprised Ben. He had never expected that he could meet so many compatriots in this programme. Of the 41 students enrolled in 2017 in this early childhood diploma programme, nearly one-third of the cohort spoke Mandarin and all of them connected through WeChat.

[10] https://en.wikipedia.org/wiki/WeChat

4.4. Technology Use in the Programme

As I experienced from the very start of the programme, these student teachers' learning journeys were enabled with and supported by technology. Technology was ubiquitous in their lives and deeply integrated into many aspects of the university and the programme. At the Induction Day, the Associate Director of the programme singled out the point that technology tools are available to connect people (field notes, 23 January, 2017). In addition, based on the University's webpage, the University explicitly states that it encourages and promotes the development of flexible modes of teaching and learning, the use of new teaching technologies, and computer-assisted learning management systems.

One key technology that students interact with is the Student Services Online (SSO) system. This manages both candidate applications to the university and once accepted into a programme, enrolment in courses. Students can access a range of relevant academic information via SSO including course advice and information, enrolment advice, fees advice, timetables, grades and course history advice, and graduation information. Student teachers can also update their personal information on SSO.

Another key technology is the Canvas learning management system. This provides a virtual platform for online course activities, communications, and resources. Students can access readings and other information about their courses and communicate with their lecturers and classmates. It is also integrated with other technology tools used at the University, such as Turnitin which is a web-based tool for checking student work for plagiarism.

All students enrolled at the university are provided with an official email account called student email. Student email is the main way in which the university communicates with students, such as communications relating to coursework and academic progress, graduation, student financials, and the library. The aforementioned information provides useful insight into how reliant upon, and integrated technology has become in modern institutions like universities.

Technologies such as the SSO, Canvas, and others like the library services, are woven into the nature of university study in ways that both expect and demand students to be proficient in their use. Student teachers must engage with these technologies as contemporary university students. Given this, workshops related to IT services are provided throughout the year to support students. These include workshops on how to create and enrich an e-portfolio, and how to

access to the online resources provided through the library. As demonstrated, technologies are pervasive in the student teachers' learning journeys.

In summary, two key points need to be highlighted. Firstly, that technology is an integral part of modern universities. Secondly, that this requires students to be proficient in using this technology as a normal part of being a student.

I observed that technology penetrated every aspect of the student teachers' lives and study. For example, each student teacher had his or her own digital devices, such as cell phones, tablets, and laptops. It was common to see student teachers come to lectures with their digital devices to take notes and search for information during the lesson. Since cell phones could be placed on the desk or in the pocket, it was not possible to count the quantity and frequency of the usage of cell phones. However, I was able to observe the number of students using laptops. For example, on seven separate days in the same course, I counted the number of students who were using laptops to take notes (see Table 4.1).

Table 4.1

Number of student teachers bringing their own laptops into classes

Date	7 Aug.	14 Aug.	21 Aug.	21 Aug.	4 Sep.	4 Sep.	18 Sep.
Brings own laptop	4	12	6	3	8	5	7
Without a laptop	29	26	22	13	18	13	20
Total number of attending students	33	38	28	16	26	18	27
Percentage of attending students with a laptop	12.12	31.58	21.43	18.75	30.77	27.78	25.93

From Table 4.1, the percentage of students bringing their own laptops ranged from a low of 12% on the first day to a high of 30% on another day. It is interesting to note that the number of students who attended the lectures fluctuated, possibly because assignments were due around the days when attendance was lowest. For example, there was a reflective essay due by 22nd

August and another assignment due by 25th August, which could have been a factor in the low attendance on the afternoon of the 21st August. Another possibility was that the students could download lecture material on-line and watch the PowerPoint from home; it could be that this was more convenient or economical.

An Educational Technology Baseline Questionnaire (see in Appendix A) was delivered to the early childhood education student teachers in Semester one. Of 30 questionnaires handed out, 27 were collected. As can be seen from Table 4.2, seven were aged between 17 and 24 years old, 16 were aged between 25 and 34, and four were in the oldest age bracket between 35 and 44 years old. From Table 4.3, two student teachers rated their overall skill in using education technology as below average, 13 as basic, and 12 as proficient. No student rated their overall skill as advanced. All of the 27 student teachers owned their own mobile phones. Nine of them used Android smartphones while 18 of them owned iPhones (Table 4.4). There was no distinguishable gap in student teachers' usage of technology between different ages. For example, the three student teachers who had taken a MOOC in the past year fell into each of the different age bands:17 to 24, 25 to 34, and 35 to 44. Overall, almost all of the student teachers had access to digital devices. Most of the student teachers had basic or proficient educational technology skills. Individual students' knowledge of and usage of technology varied.

Table 4.2

Distribution of student teachers' age according to the questionnaire

Age	17-24	25-34	35-44
Number of students	7	16	4
Percentage (%)	25.93	59.26	14.81

Table 4.3

Student teachers' self-rated overall skill in using educational technology

Overall skill	Below basic	Basic	Proficient	Advanced
Number of students	2	13	12	0
Percentage (%)	7.41	48.15	44.44	0

Table 4.4

Student teachers' usage of mobile devices

Mobile devices	Android smartphone	iPhone
Number of students	9	18
Percentage (%)	33.33	66.67

From an analysis of the students' use of the Canvas site, it is evident that students regularly viewed pages. Analysis of Canvas page views and participations of individual students from five courses was collected (Table 4.5). The maximum and minimum page views of the students enrolled in Course 1 are 1629 and 91 respectively, which meant one student viewed the pages at most 1629 times, while another student viewed 91 times.

Table 4.5

Number of Canvas page views and participations

Courses	Page views			Participations		
	Average	Max	Min	Average	Max	Min
1	401.231	1629	91	0.821	4	0
2	581.781	2162	155	17.659	87	1
3	344.45	1375	16	0.5	5	0
4	409.575	1690	120	1.375	5	0
5	455.244	1969	116	2.78	9	1

From the page views of Canvas, it is evident that every student teacher uses Canvas frequently, ranging from a low of 16 times per person to a high of 2162. The difference between the maximum and minimum number of page views and participations could be explained by apparent gaps among individuals' use of technology. Courses 1, 4, and 5 have similar average page views, while the average page views of Course 2 are obviously higher than the others. The average participations of Course 2 are also dramatically higher than the other four courses. The average page views and participations of Course 3 are the lowest among these five courses.

The differences among various courses are related to the lecturers' requirements and personal usage of Canvas.

Student teachers' usage frequency of Canvas also varies over the semester. Figure 4.1, extracted from Course 3 (Semester one) and Course 5 (Semester two) data, illustrated student teachers' overall activities by date. At the beginning of Course 3, the students' participation was activated. According to the course plan of Course 3, two assignments were scheduled on 12th April and 26th May. Students also participated actively on Canvas at the beginning of April and the end of May which could be related to the submission of their assignments. At the end of July and the beginning of August, the start of Course 5, the students' participation was activated. Then the students participated actively in the middle of September and early October which could possibly be attributed to the submission of their assignments due on 8th September and 2nd October. From November, when Course 5 was almost completed and the students were on practicum in the centre, the page views were lower than usual.

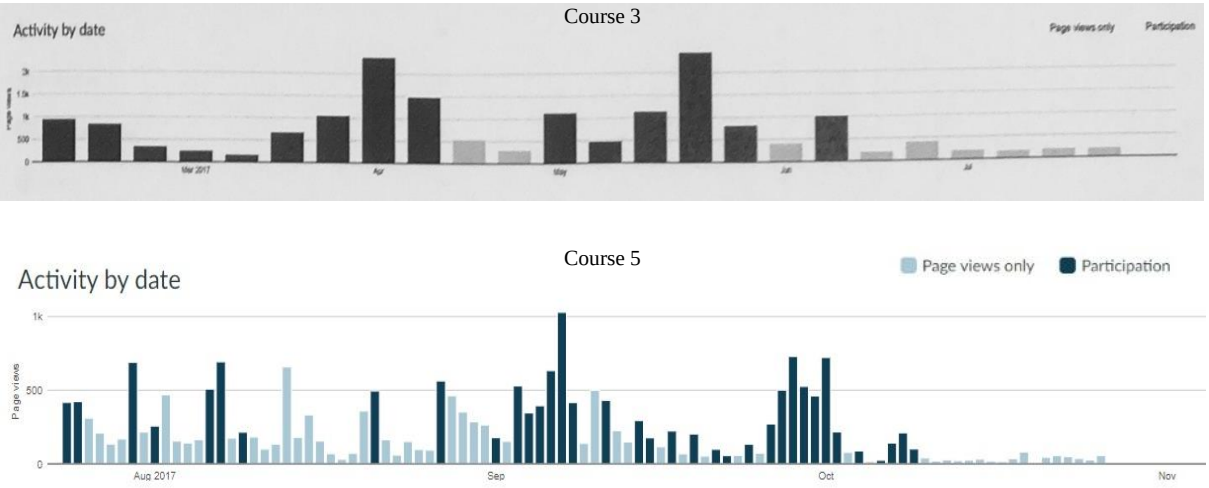

Figure 4.1. Student teachers' activities on Canvas by date

In summary, technology is an integral part of modern universities which requires students to be proficient in using this technology as a normal part of being a student. Student teachers enrolled in this programme are equipped with personal devices and embedded in the modern university learning with technology.

4.5. Teaching Pedagogy

This programme was offered across two extended semesters using a blended mode of delivery which included campus-based lectures, group work and workshops, web-based access to online resources, collaborations and self-directed study, and early childhood centre-based practicum placements. The campus-based teaching was delivered in different classrooms. Some were held in specialist rooms, for example, the dance course was held in a dance room and the Māori early childhood education course sometimes took place in the Marae.[11] However, most of the courses were taught in standard classrooms with multi-media devices including an iMac, a data projector, and screens. The moveable tables and chairs were typically set into groups as shown in the photograph (see Figure 4.2). This configuration enabled a pedagogy based on student teachers sitting in groups, discussing topics, and sharing ideas. This collaborative pedagogy was common in most courses.

Figure 4.2. A typical classroom in the teacher education programme

Typically, before the start of a lesson, the lecturer would upload the PowerPoints and related readings on to Canvas LMS. This allowed students to access to the information if they wanted.

[11] A marae is a communal place that serves religious and social purposes in Maori culture.

During the class, the lecturer would instruct with the PowerPoint and put forward questions to the students to discuss in small groups. Student teachers also occasionally had collaborative writing assignments in which they worked together to produce a single paper using Google Docs or a presentation by the group. The usage of these technologies in the programme was intended to support the student teachers to learn and develop digital literacy and e-Learning skills so that they could become active users in future-focused learning environments.

Rather than a transmission pedagogy with a lecturer inducting knowledge in front of all the students sitting in rows, the teacher educators I observed taught using collaborative pedagogy. In addition, lecturers also utilised various activities to make their teaching clearer and more inclusive. Students learnt through experiencing the sort of activities that they could replicate in early childhood centres, for example, songs they could use or books that they could read aloud. In the Exploration course, student teachers made keyrings and badges themselves. They learnt about the design process in technology and manipulative skills rather than how to make badges. The practical component of courses was appreciated by the students.

Chapter 5. Amy's Journey

5.1. Who is Amy?

a. Background

Amy is a 26-year old[12] female student, born in 1991. She was born and brought up in the northeast part of China, in a well-developed coastal city. Her father was busy working and had to go to business trips frequently while her mother also worked full-time. Therefore, during Amy's childhood, she was brought up, almost exclusively, by her grandparents. At that time, an elder female cousin with a similar situation as Amy was also looked after by her grandparents. They grew up together and were very close to each other. After Amy had studied in New Zealand, she claimed that she missed her grandparents more than her parents since she was very close to her grandparents and they were getting older which made her worried about their health.

Amy recalled that 20 years ago when she was in primary school, the layout of the classroom was not complex as shown in Figure 5.1 (drawn by Amy). In the front corner of the classroom, stood a storage cabinet, in which the teacher placed the cleaning supplies. That corner was also designed as a reading zone with a couple of books on the cabinet. The only blackboard was on the front wall, beside the reading corner, which was painted green to protect the students' eyesight. Amy mentioned no technology devices in her primary school. Throughout her primary schooling, there was little impact of technology.

Amy recalled that her first contact with the mobile phone and data projector was in secondary school. In her high school, resources were similar to those in her secondary school, for example, the data projector. Throughout her secondary and high schooling, the usage of technology was more prevalent than in her primary school. However, the technology did not evolve much during this time. When Amy studied in university, she recalled that there was no access to the internet from her dormitory. She bought plenty of textbooks and used pen and paper to take notes. When she did her assignments, she usually went to the library and used a computer to search for information.

[12] In 2017, the interview date, the interviewee was 26 years old.

Amy received her bachelor's degree from a teacher training university, a normal university[13] under the provincial government in northern China, majoring in Political and Ideological Education. This university was primarily responsible for educating teachers to teach in the province, though non-teacher training courses were also offered. Political and Ideological Education focuses on the cultivation of the virtues, knowledge, and skills necessary for political participation. With this major, Amy could have been a political teacher in secondary school. After her graduation, she did not search for jobs but chose to study further, abroad in New Zealand.

After she moved to New Zealand, Amy began to use her own laptop to study. At the very beginning, she did not adapt to applying the laptop and was not used to reading on screen. She preferred to print the reading materials out. Then, she gradually got used to studying with the laptop and found it effective to make comments in a Portable Document Format (PDF) document rather than printing out the paper. During this process, as Amy gradually used more technologies, she became more confident and capable of using technology and found more advantages of using technology.

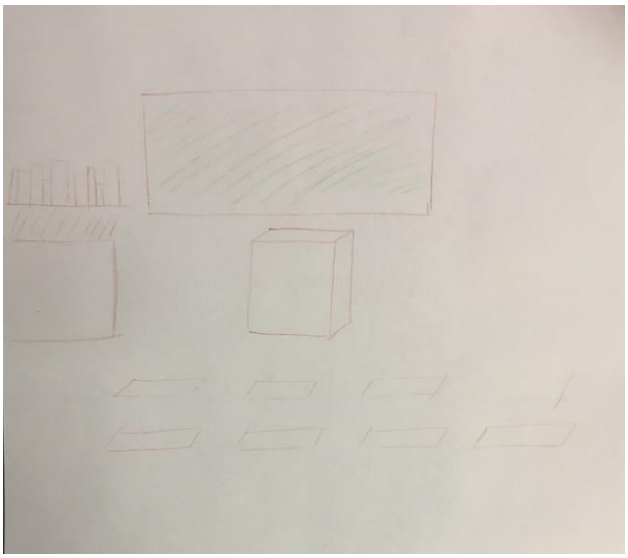

Figure 5.1. The appearance of the primary school classroom 20 years ago – Drawn by Amy

[13] This university in which Amy enrolled was established in 1951, as part of the newly founded People's Republic of China's drive to reform the teacher training system. Under that teacher training system, certain institutions of further and higher education were established with the role of training future teachers. The normal universities comprised the highest point of this reformed system and were the only institutions from which senior high school teachers could graduate. As the Chinese government moves away from the system and more and more teachers are being recruited from regular universities, most normal universities have expanded to offer many non-education-specific courses and to increase their focus on research.

Amy is a quiet and introverted person. She described herself in an interview as:

> *I used to be a kind of super-introvert. I just dare not talk to strangers. When I spoke out, I always accelerated heartbeat and blushed. After a long time, since you cannot always be like that, you have to go to the society, and you have to get along with people. Then I began to push myself to step out of my comfort zone. Gradually, I tried to talk to more and more people. I think it's much better. Now I still rarely speak in class. I feel embarrassed. But I think people sometimes really should push themselves to try something new*. (Retrieved from Amy's second interview, page 10, noted as A2-10.)

As an introvert and the only child in her family, this choice of studying abroad could be seen as a new adventure for Amy.

Technology has now become pervasive in Amy's life. With the flight ticket booking from an online website, Amy set off her journey. Although she mentioned that she had friends in New Zealand before she came here, she did come here alone. She made two friends, one female and one male, of a similar age to her, from language class after she moved to New Zealand. The three of them discussed and decided to rent a house and live together. Then they looked for houses and bought furniture together through an online website. It was fairly convenient to do with access to the internet since they could compare the houses and furniture online before they paid a visit on site. After their first rental term expired and could not be continued, they searched for a second house together. For around two years of co-tenancy, they cooked together sometimes and socialised together frequently, but also had relationship issues from time to time. Amy felt very fortunate to have met such kind friends who could share happiness and hardship, and understand and support each other in a foreign country. Over their two-year co-tenancy, they built up a close friendship. In fact, even though there were opportunities for them to take one-month vacations from New Zealand, they continued to pay rent in order to maintain their room rather than let it to others.

Amy describes how her use of technology permeates her daily life: *'Oh, my way of life, I just can't live without my mobile phone or my computer in everyday life'* (A4-3). Amy's first mobile phone could be traced back to around her secondary school. Now, she has her own iPhone, iPad, and MacBook laptop. Regarding the disposition towards using mobile technologies, Amy rates herself as a keen user. Besides what has been mentioned above, that is, she booked flight tickets and searched for houses online, she always kept her phone connected to the internet and kept connected with her friends and family using her phone. Through applications on the

iPhone and with mobile data, Amy could make video calls to her parents in other countries. It is a convenient and affordable way to connect with others, especially those at a distance. For example, Amy usually makes video calls to her mother in China one or two times per week. It is free to do this through applications such as WeChat on her iPhone as long as she has enough mobile data. Since free Wi-Fi is all around and the unused mobile data from previous months could be accumulated into the next month's allowance, Amy always has enough data on her phone. This easy and accessible way of communicating has relieved Amy's homesickness and loneliness.

Regarding her overall skill in using educational technology, Amy rates herself as a *'proficient'* user. For example, when using the web to learn about something, she claims her search is fast and efficient, typically getting what she needs on the first attempt. Moreover, Amy has downloaded several applications on her iPhone. One of the applications is a Chinese-English dictionary. No matter when she gets stuck with a new word or phrase, she just brings out her iPhone to get a translation.

In the interview, she described the diploma programme she enrolled in at the New Zealand Tertiary College as basically, an online course. The programme was a one-year Postgraduate Diploma in Education (Early Childhood Education). She went to the college campus once per term and spent most of the time studying at home, online. There was a reading list each week. Amy had to complete the readings, then post her own understanding of the reading materials, or participate in a discussion online to share thoughts on the readings. Besides that, there were two assignments each term. Amy finds it is beneficial to study online since you can save the commute time and study at home at any time. However, Amy also complained that during this online learning journey, the disadvantage was that she could not communicate with other classmates or lecturers face-to-face.

While she is likely an independent technology user, Amy also claims that she needs support on utilising technologies. From the Educational Technology Baseline Questionnaire, it shows that rather than using initiative, she prefers to follow the rules when using mobile technologies. Instead of a risk-taker, Amy considers herself as more risk-averse.

b. Motivation and aspiration

Amy is the only child of her family; therefore, she got very close to her cousins. One of her cousins, with whom Amy had a relationship which was as close as an elder sister, gave birth to

a daughter a few years ago. Amy frequently played with the new-born baby and really enjoyed it. Up until then, she had not been very fond of children. Gradually, with that experience with her cousin's daughter, she discovered her interest in playing with children and began to think about doing this as a career. Although her bachelor major mainly focused on training teachers to teach in secondary school, the enjoyable experience with her cousin's child also made her think about working in an early childhood area. This was one reason that influenced her decision to study further after she finished her bachelor's degree.

In the last year before her graduation, a few of her friends planned to study abroad for further education. At the same time, she heard from a friend in New Zealand that early childhood education in New Zealand was *'pretty good'*. Therefore, from that point of time, as she recalled, *'by coincidence'*, she began to consider studying early childhood education in New Zealand. Amy's mother has retired, while her father still works abroad year-round. Her father once visited New Zealand, several years ago, for a business trip and was impressed by the pleasant climate and beautiful scenery. Based on that brief encounter, her parents were supportive of her decision to study in New Zealand.

By the beginning of 2017, Amy had been in New Zealand for around two years. The first year after she arrived in New Zealand, she mainly worked on her language in order to pass an English test. For the purpose of enrolling in a teacher education programme and being a qualified teacher in New Zealand, as a Mandarin-speaking student, there were strict requirements for English proficiency. For instance, achieving a minimum score of 7.0 in each component of the academic version of the IELTS test. She completed a postgraduate diploma programme in New Zealand Tertiary College in 2016. However, that diploma focused on education rather than teaching. With that diploma, she could not register as a certificated teacher.[14] Therefore, she enrolled in the diploma programme, which is the site of this research, in 2017 after which, she could register with the Education Council. Amy stated that she truly loves being with children and really wants to work as a registered teacher.

Before Amy came to New Zealand, what she heard from her friends about this country was that New Zealand was a *'super excellent'* country. After she arrived, she did not think that it

[14] In New Zealand, all teachers must be registered with the Education Council and have a current practising certificate, which means completing an Initial Teacher Education programme that is approved by the Education Council. Registration signals that a teacher has met the initial requirements for entry to the teaching profession, which includes satisfactory training to teach, good character and fitness to be a teacher. A practising certificate provides assurance from the Education Council about a teacher's good character, fitness to teach and competence.

was *'particularly good'*. However, she did not *'feel bad'*. Amy thought Auckland was similar to her hometown which, as mentioned above, was also a seaside city. Amy claimed that the environment in her hometown was not as clean as in New Zealand. Even though she felt that fewer people were living in New Zealand, which might be boring to some extent, it was not a problem for her. Amy was originally not the type of person with plenty of social activities so in this regard, she did not feel disappointed. During the two years of her study, besides her parents' financial support for her tuition fees here in New Zealand, Amy also worked part-time in a takeaway restaurant on weekends to subsidise her living expenses. With a part-time job, a study programme, and several close friends, gradually, Amy began to get used to living here. Therefore, even though she was initially not that keen to live in New Zealand, she made her decision to stay.

c. My impressions

Amy grew up with her cousins and became close to them. Her enjoyable experiences with one of her cousin's new-born daughters inspired her into early childhood teacher education. Amy was supported by her family to pursue a learning opportunity abroad. Even though Amy was an only child, her parents were supportive of her abroad study financially and spiritually. As with my own parents, this support for children to study abroad is based on our parents' desire to give us what they consider to be the best opportunity. Language was an important barrier for Amy to overcome before she could learn and teach in English.

Technology permeated Amy's daily life and educational environment in New Zealand. She rates herself as a *'keen'* and *'proficient'* user, but this was initially to maintain contact with her family and to set up her living environment in New Zealand. Using it for educational purposes was something that she became more used to, and proficient with, as she studied. As with other language learners, technology was a useful tool for translating English into her first language and lowered the barriers to studying in a second language. Technology also afforded the ability to record lectures so she could replay and listen to them again.

5.2. Amy's Learning Pathway

a. Campus-based – technology for learning

Over the duration of Amy's learning journey, I had the opportunity to observe her in classes and interact with her through interviews, WeChat, and her reflections. In this section, I have included what Amy wrote as her typical daily schedule. During term-time, she was attending classes and doing assignments for most of the day. I have created two scenarios based on my observations and field notes to give a sense of what Amy's presence on campus looked like to me. I comment on these scenarios and then introduce the importance of technology to Amy.

Daily routine example (Retrieved from focus group interview, page 9)

> 6.00a.m. Get up
>
> 7.00a.m. Drive to school
>
> 8.30a.m.-12.00p.m. Class
>
> 12.00p.m. Lunch time
>
> 1.00p.m.-3.00p.m. Class
>
> 3.00p.m. Finish & Go home
>
> 4.00p.m.-6.00p.m. Do assignment
>
> 7.00p.m. Dinner
>
> 8.00p.m.-10.00p.m. Do assignment
>
> 10.00p.m. Sleep

This is Amy's daily on-campus routine. Amy did nothing outside of studying from 8.30 am until 10.00 pm, except for eating and sleeping. Lectures and assignments occupied the day. Even though technology was not specifically mentioned when Amy described her schedule as just going to lectures and classes and doing assignments all day every day, it was still there, always in the background. Her laptop and mobile phone were constant companions.

Scenario one

> Amy stepped into the classroom and sat down near another Chinese student. They chatted in Mandarin about the requirements of their next assignment for a few minutes. Then, the lecturer stepped into the room. Amy stopped chatting and brought out her notebook and a pen. In the first section of the class, the lecturer gave feedback on the students'

participation task. To segue into the new content of that day's course, the lecturer displayed a children's picture book using the computer and the projector. During the course, Amy used her pen and notebook to take notes. When the lecturer mentioned the reading paper for the next week, Amy brought out her iPhone and took a picture of the name of the paper. During the class, Amy wrote down a word with a question mark. After class, Amy took that word and asked the lecturer for an explanation of that concept. (Based on field notes of an observation on 22 March, 2017.)

Scenario two

Amy walked into the classroom and found a seat near the window in the front group. Then, another Chinese student joined her, sitting next to Amy. Amy opened her MacBook and logged in to her Canvas site. As she was reading the assignment requirement on the Canvas, the lecturer walked into the room. The first section of the class was deliberating the assignment requirements in detail. Amy took out her iPhone to record this section since she did not want to miss any details. To better understand the lecturer's requirements, she could listen to the recording later. When the lecturer made requirements about the writing style, she also introduced an APA website to which the students could refer. In the second section of the class, as the lecturer taught new content, she also introduced many online resources to the students, such as the New Zealand folksongs website, Maori Dictionary, and eTV. To make the resources available and convenient to access, the lecturer put the resources list on Canvas where the students could get direct access. (Based on field notes of an observation on 21 August, 2017.)

Scenario one is an example of Amy's use of pen and paper to take notes and application of phone to facilitate note-taking in Semester one. Scenario two, in Semester two, reflects the change of Amy's note-taking method. She used a laptop to replace pen and paper to take notes in class. She also used her phone to record the lecture which enabled her to replay the audio of the lecture and figure out anything she was confused. In this section, I will focus on Amy's learning journey, based on campus, embedded with technology.

i. Amy's adapting usage of evolving technologies

Technologies applied in education have been constantly evolving. Amy's portrayal of her primary classroom (Figure 5.1) had few technologies. Two decades later, Amy enrolled in this early childhood teacher education programme. Amy described their classroom with technology

devices as *'very advanced'*. This comparison between these two different settings, across different times, can be related to her 'apprenticeship of observation', which is integral to how her ideas of teaching were formed. As Amy commented in her first interview,

> *For example, in the classroom, basically, apart from the windows, there are projectors and TVs on all three sides. In that way, regardless of where you are sitting, you can see the screen clearly. The facilities are very good. (A1-2)*

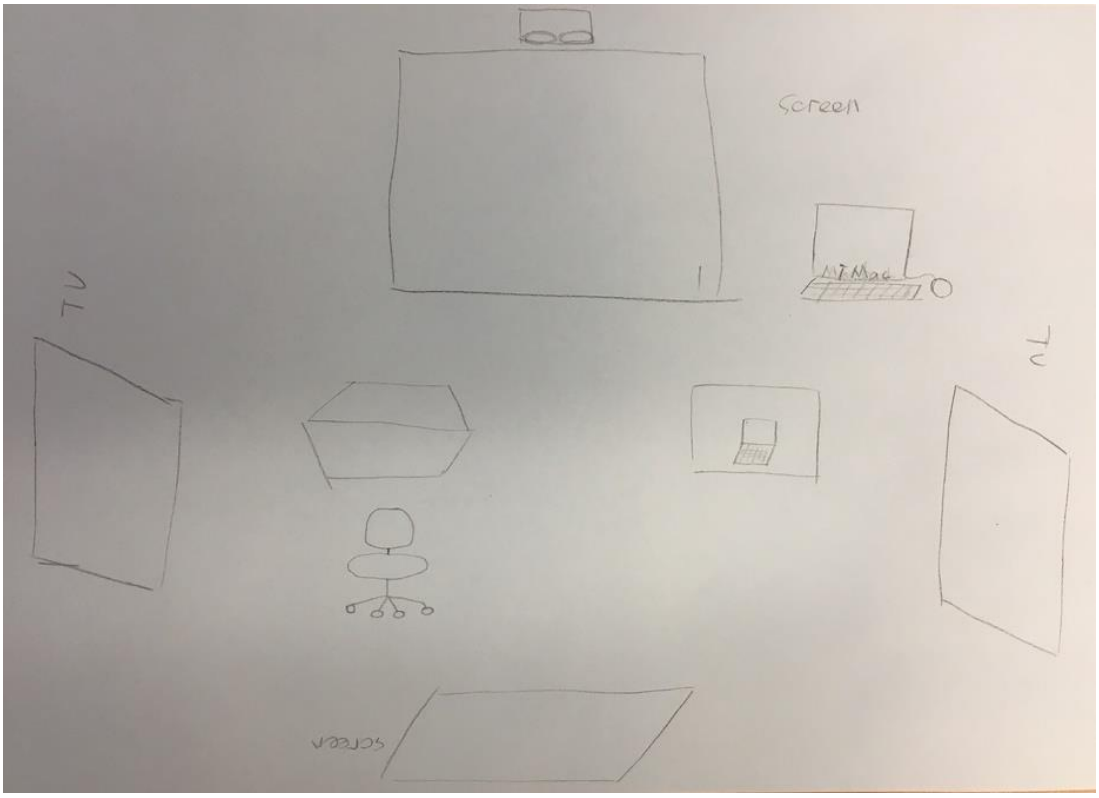

Figure 5.2. The appearance of the lecture classroom – Drawn by Amy

From the picture she drew (Figure 5.2), Amy displayed the TVs on three sides and the projector screen in the front of the classroom. Besides the screen was the iMac for teachers' use. Students could bring their own laptops to class, which was also shown in Amy's picture through a laptop on the desk. Amy drew a chair with wheels to specify the movable chairs and desks in her drawing. She also drew a hexagonal desk to explain the various arrangements of the desks such that the students could sit in groups in different numbers.

Amy perceived the room as *'advanced'* because of the educational technologies. Even though the devices she mentioned (such as TVs, projector screens and iMac) are not cutting-edge technologies, they are advanced technologies compared with what was used twenty years ago.

By explaining what she means by the term *'advanced'*, Amy also refers to the spatial settings, such as the movable chairs and desks.

The learning space design could influence the pedagogical activities. For example, Amy expressed that with TVs and projector screens on the walls of the classroom, students could see the content displayed on the screens clearly from every corner of the room. Combined with the movable chairs and desks, students could sit in fluid groups which increased learning opportunities through collaboration and discussion.

As I observed, Amy's use of technologies has adapted over the course of her studies. For example, her note-taking changed during the programme. In the first semester, she wrote notes with pen and paper because it was the way with which she was familiar. In Semester two, Amy changed her way of note-taking. Rather than writing notes with pen and paper, Amy began to use a laptop in the class to type notes with Word software. It turned out to be an easy and effective method for her, particularly when she needed to search for information on her laptop rather than hunting through sheets of paper, when she wanted to review her notes, for example. Amy began to carry a laptop with her to almost every course from the very beginning of Semester two (A3-1). Besides walking to the library to borrow books, Amy often searched the university library website for reading materials and she found the WebQuest database fairly helpful for her.

Amy's usage of technologies gradually changed. She gradually integrated more familiar technologies into her study, such as her mobile phone and her laptop, which were commonly used in her daily life. Technologies which were usually used in daily life were comparatively easily adapted into educational settings. However, to embed technologies into new educational settings needed time, even with familiar technologies. For example, Amy was proficient at using her laptop. She used it to do assignments with Word and to search for online information, but not note-taking, during the first semester. She had kept the habit of taking notes with pen and paper since she was in primary school.

The previous paragraphs describe the evolution of Amy's use of technology in her studies. She adapted because it was easy and effective. Technology affords Amy an easy and effective way to study. Besides, Amy was adapting to the environment and also co-evolving along with the environment. As Amy described herself as risk-averse regarding using technologies, she was reluctant to change her habit and attempt new technologies until she began to find the advantages of it. She started to use her laptop to take notes in the second semester as she found

it was an easy and effective method. After doing this, she further found it effective and convenient to review notes with her laptop. Therefore, Amy's use of technologies also influenced her perspective on technology. Her use of technology and perspective towards technology interacted with and reinforced each other.

ii. Amy's perspective on teacher educators' usage of technology

Technologies were widely and frequently used by teacher educators throughout the programme. Amy listed the technologies she recognised as being used by the lecturers in Semester one as the computer, PowerPoint, video, and Google Docs (A3-2). During Semester two, the lecturers used similar technologies as in Semester one, such as data projector, Google Docs, and Google Drive. With the availability of iMac and data projector in the classroom, PowerPoint was used by almost all the lecturers. Some of the lecturers also played videos and music during the class. Amy considered them as a convenient, effective, and interesting way to deliver lessons. For example, Amy commented on the lecturers' use of PowerPoint as an *'interesting'* way to teach.

The Canvas LMS was used by the lecturers to upload the course plan and teaching materials, such as the PowerPoints and course readings. This was the only way that students could access this information since no course booklet or printed notes were made available. Almost all of the content related to the courses could be found through Canvas. During Semester one, Amy used Canvas frequently. It became a central hub through which the course and its teachings were organised. Basically, she used it every day as lecturers usually posted announcements on it (A1-2). Some of the lecturers also opened the discussion forum on Canvas for the student teachers to ask questions and share ideas (A1-2). Canvas was also necessary when student teachers submitted their assignments. After submission, they could receive feedback from teacher educators through this platform. Although Amy found this platform quite useful and powerful, there were some drawbacks she found when using it. For example, Amy found that feedback could not be downloaded which was a problem for her because she wanted to save the document on her laptop to refer to later.

Besides the convenience, efficiency, and interest that technology afforded, Amy also identified that the lecturer used technology to enable collaboration between students and ensure that everyone was participating. For example, with the application of Google Docs, in an assignment, a team of students could individually work from different locations and at different times to collaborate successfully. At the same time, it also added an additional layer of

surveillance on group work because, as Amy commented about the lecturer, *'she can not only see your results, but also see who made the contribution, who wrote it, and who edited it' (A2-6)*. Therefore, the lecturer could assess the collaborative assignment based on an individual's contribution, which could stimulate students' efforts in the collaboration. In this situation, technology enabled students to be connected, while at the same time, students' individualism was respected. It was helpful to do group work using technologies.

Amy's perspective on how technology was used to structure learning was also influenced by comparing her experiences with two different educational programmes. Compared with the way technology was used to enable a remote learning experience in her first programme of study in New Zealand, Amy found the blended approach used in the teacher education programme was more beneficial for her. Rather than studying by herself online, isolated from others, she preferred the interactions with classmates, all sitting in a physical classroom, listening to a lecturer together. She appreciated the face-to-face learning time and the relationships with other students and lecturers. She thought it was beneficial and motivational for her to learn through group work, discussions, and listening to the opinions and views of her peers. Considering her previous fully online learning experience, Amy believed that teacher educators should focus on the way technology could enable quality interactions and relationships with the students rather than using the technology to present information.

Amy's experiences of different courses within the teacher education programme also gave her good insight into how important it was to ensure that the technology being used was appropriate to the content being taught. For example, in one discussion, Amy compared the way two courses were delivered through integrating content and activities. One course she thought was well taught, while with the other course, she struggled to always see the connection. She explained the two lecturers involved,

> *I feel that what she wants to teach is clearly explained through the activities. Including some of her assignments and the course content are all related. Every time you finish a game, you will get to her point. I think this is very important. Some people don't think carefully but simply use many technologies and make the course plan seem to be complicated. But it could be overused while you still can't understand what he is talking about. Or there's no relationship between the activities he does and the content he teaches. (A3-3)*

In making these comparisons, Amy expressed her opinion of technology use in class. As the activities should work for the teaching content, Amy believed that technologies should also be used to deliver the course in better ways. It was not how many technologies were used in class but how the technologies were used that mattered.

iii. Amy's usage of technology

Amy was active in the WeChat group from Semester one. She often interacted with the others and commented in the ECE group. For example, the Chinese Lunar New Year occurred a few days after the Induction Day. Even though they had only recently met, the group exchanged blessings through the platform. Amy also sent a red packet[15] with her best wishes for the coming New Year to the WeChat group. The WeChat technology not only enabled such interactions, but also afforded the opportunity to develop a sense of community based on the same language, shared culture, and trust in each other.

As a community, the WeChat group were also able to support each other's learning. For example, at the very beginning, Amy asked the other group members for help in acquiring a chapter from a book through the WeChat application. Over time, this progressed to where she became the one sharing the reading materials to others in that virtual group. During the class, Amy took pictures of the material shared by the lecturer with her iPhone instead of writing it down (22 March, 2017 – observation notes). She once shared some photographs of reading materials she took from the lectures to the WeChat group members (30 March, 2017 – ECE WeChat group). The group members were very thankful and praised it as an effective way to take notes. Besides other students' praise, Amy also received other students' suggestions and asked for help through this WeChat group. Amy was active in this group to support others and be supported. The usage of technologies became embedded more deeply and more entrenched. It was this atmosphere of mutual support that reinforced a supportive group.

Besides topics related to studying, Amy also shared her feelings and experiences through that WeChat group platform. This learning community kept active throughout the year to the end of the programme.

[15] Traditionally, Chinese usually delivered a red packet filled with brand-new money inside on the New Year Festival and special occasions to send their blessings and wishes. Recently, with the emergence of online payment and the popularity of WeChat, more and more young people send a red packet through WeChat.

iv. My impressions of Amy's use of technology for her learning

Amy's use of technology adapted to, and co-evolved along with, the environment. Technology afforded her an easy and effective way to learn. Amy described herself as risk-averse to using technologies because she was reluctant to change her habits and attempt new technologies until she began to find the advantages of it. Technology also affords the opportunity for Amy to connect with others, construct a learning community, and collaborate with others during the process of learning to teach.

Rather than online learning, Amy preferred the interactions with classmates and teacher educators. She appreciated the face-to-face learning time and connections with others. Regarding teacher educators' use of technology, Amy believed that technology should be used properly to deliver the course and enable quality relationships with students. Watching Amy interact with her peers in the sessions, sitting alongside them and sharing conversations and ideas made me realise the importance of face-to-face contact.

b. Practicum based – technology for teaching

Amy kept writing reflections of her teaching activities when she was on practicum. She shared her experiences with me over coffee and through interviews. In this section, I have attached Amy's description of her daily schedule on practicum. Excerpts from two reflections were included to give a sense of Amy's experience on practicum. Then, I comment on these reflections and discuss my interpretation of Amy's learning journey with technology.

Daily routine example (Retrieved from focus group interview, page 10)

7.00a.m. Get up & go to the centre

8.00a.m. Start & set up

8.30a.m. Children come

9.00a.m.-10.00a.m. Mat time & group plan of making paper city & play dough

10.00a.m. Morning tea

11.00a.m.-12.00p.m. Reading books & individual plan for learning English

12.00p.m. Tidy up

12.15p.m.-12.30p.m. Mat time

12.30p.m. Lunch

1.00p.m. Water play

1.30p.m. Change clothes

2.00p.m. Tidy up

2.15p.m. Mat time

2.30p.m. Children leave

3.00p.m. Staff meeting

4.00p.m. Go home

Technologies involved: music player, computer, Google site, Word, Story Park

This is Amy's daily on-practicum routine. Amy was busy at the centre from 8.00 am until 4.00 pm. Besides the on-practicum daily routine, Amy listed the technologies used in the centre. Even though technology was not visible in the timetable, it was a constant companion for the student teachers.

Reflection one

> *This morning…I saw a teacher and several children surrounding the butterfly corner. They had been waiting for the butterfly hatching out for nearly one hour. Almost a half of the butterfly has come out at that moment. However, they left to do something else very soon. [sic] In the late morning, the butterfly finally hatched out. Kai was so excited to watch that, and he loudly called others to have a look. During observation, I thought up that yesterday we watched a video talking about butterflies. I learnt that when they just hatched, the wings are still wrinkled. So I reminded children to notice the wings of the butterflies.*
>
> *Actually, this is my first time to observe a butterfly hatching out. I realise that teachers are not always more knowledgeable than children. There are some opportunities we are able to learn something new together, and sometimes teachers need to learn from children. That is because everyone has different life experiences and learning backgrounds: they could be professional in different areas. On the other hand, I plan to broaden my horizon in order to better support children's learning. For example, I am going to watch some scientific videos.* (Retrieved from Amy's reflection on the first practicum, page 2, noted as R: A-1-2)

In Reflection one, Amy reflected on her use of technology for professional learning, such as watching a scientific video to teach children science. Furthermore, she recalled a teaching activity observing butterflies to illustrate her experience and understanding of teaching children and encouraging children to explore the uncertain world.

Reflection two

> *This morning, a Chinese girl came to visit preschool with her grandma. Unfortunately, grandma cannot speak English and no teacher in the room speaks Mandarin either. Therefore, I was asked to do translation. Actually, the girl's mother has visited the centre previously, and she talked with teachers in English. However, today she was not available to come here, so grandma came with the girl for her first visit, but she did not know what time to take the girl home. I greeted grandma, told her the time to come, and also comforted her that the girl would be fine while walking her out.*
>
> *I've been in the centre for two days. Although I noticed that we have children from the families with different cultural backgrounds, including Chinese, I did not find any language barrier from children's daily communication experiences: they can understand English quite well. And their parents are able to communicate with teachers in English. Therefore, I did not imagine that we could have problems about language in the centre. (R: A-2-1)*
>
> *As English is not my mother language, I can understand their feelings while they are facing the difficulty of language. I hope I can help them more in the future. Meanwhile, it is my pleasure to make a contribution to the community. I believe there should be more solutions coming up to cope with the problem. Although an agency [such as a multi-language teacher or an interpreter] who can speak different kinds of language can be helpful, it is hard to accomplish in all the centres. Perhaps we can try a variety of ways to communicate with families, both verbal and non-verbal. For example, we can talk to them first, and email the same contents to them later. As a result, if they cannot totally understand in conversation, they can still work on it in another way. I am going to do more research and try to figure out more solutions.* (R: A-2-2)

Amy reflected on the enabling aspect that speaking Mandarin afforded. Since the Mandarin-speaking grandmother could not speak English, Amy greeted her in Mandarin which relieved the grandmother's embarrassment and helped her to know her grandchild's behaviour in centre.

Though Chinese, as her first language, constrains Amy's learning in English, it enables her to communicate with Mandarin-speaking parents and grandparents. Amy was inspired to find solutions for effective ways to communicate with families, especially those that were non-English-speaking families.

The aforementioned reflections and schedule help to get a sense of what happened in practicum through Amy's lens. In this section, based on the data from her reflections, assignments, and our conversations, I have explained Amy's journey on practicum embedded with technology.

i. Amy's usage of technology for facilitating teaching

Technologies supplied in early childhood centres are basic and limited. The first block of practicum came in February. When she was questioned about what technologies were used in her practicum centre, she first replied with television.

> *Our centre has a television. Sometimes on a rainy day, children may watch TV together with the teachers. There's a programme called 'Suzy's World'.*[16] *In the TV series, there's a female host. She does a whole set of videos. She introduces different things. For example, she once talked about the butterfly. And it is mainly about some science knowledge. In the centre which I visited before, children there also watched TV. Sometimes they watched cartoons or movies.* (A1-2, 3)

Besides television, Amy also mentioned other technologies used in the centre, such as CD players.

> *At the end of each day, preschool children come to our room and listen to CD stories with toddlers together.* (R: A-2-5)

> *I do know bi-culturalism is significant in our curriculum, and I do respect Maori culture. I tried to say a few Maori words with children, and I played Maori language stories for them by CD player in mat-time.* (R: A-2-7)

Amy found teaching with technologies to be an effective way to attract children's attention. They could be absolutely quiet when they watched the television. Since *'Suzy's world'* is both

[16] 'Suzy's World' is a popular television series in which there is a female teacher who introduces science in an interesting way. This programme is based on the New Zealand Primary School Science Curriculum.

helpful and interesting, Amy also quoted this television series in her later interview and indicated that she might want to use this in her following practicum centres.

Besides using technologies to manage teaching, Amy also used technology as an evaluating tool. She utilised a camera to take photographs and used a computer to write learning stories to record children's learning journeys.

Amy applied technologies to promote her own professional development. As she mentioned in her reflection, she would watch more scientific videos to better support children's learning. She also used a camera to take photographs to attach to her reflection.

> *We may record some of the responses by photos, learning stories and pedagogical documentation. Revisiting what we document is helpful for us to do reflecting and evaluating.* (R: A-2-9)

Last but not least, technologies could be helpful in supporting communication between teachers and families. For example, Amy reflected that emails could be supportive to connect teachers and families.

ii. Amy's usage of technology influenced by early childhood centres

Amy's usage of technology was influenced by the condition and regulation of different early childhood centres. For example, in her first practicum, Amy could use her own iPhone to take pictures for learning stories while in her second practicum, she was restricted from using her own phone in the centre (A3-2). In the second centre there was a camera to take photographs on site.

Amy had a seven-week practicum in Semester two in a kindergarten. She had worked in two different early childhood centres in Semester one which had more autonomy to have their own rules. Kindergartens, on the other hand, are controlled by the Auckland Kindergarten Association, and adhere to the association's rules and regulations. Amy felt this practicum in kindergarten was stricter and more stressful.

Amy frequently brought her laptop with her to the kindergarten. Amy considered this last practicum more pressured than the previous ones such that she had to do some work during the break in the middle of the practicum day. She used her laptop to make notes about children's learning and to write down children's learning stories and her reflection of this practicum. By contrast, she used to do this work at the end of the practicum day during her first practicum.

She did not take her laptop with her to the first two centres. Amy considered her laptop as an effective and essential tool in her last practicum.

iii. My impressions of Amy's use of technology for her teaching

Amy was an only child in her family and had prior experience of growing up with her grandparents. I am sure that this influenced Amy's willingness to communicate with the child's grandparent. Such intergenerational relationships are, perhaps, more common in China.

Through Amy's lens, technology enables many affordances–for example, to record children's learning stories and support communication between teachers and families. Though Amy experienced the use of technology in her practicum, she preferred that children develop social networks with each other rather than spend time on the screen in centres. She wanted to interact with children face-to-face to be connected with them. Amy saw technology as a tool to help her connect with the children's learning and their families.

c. In retrospect – three fundamental problems in Amy's becoming journey

In this section, I have revisited Amy's journey of learning to teach with technology, mediated by the three fundamental problems.

i. The problem of the 'apprenticeship of observation'

Amy was not fond of children initially but with the experience of playing with her cousin's daughter, she found her interest in early childhood education as a career. Her apprenticeship of observation motivated her into studying this early childhood teacher education programme and built her confidence to pursue her career in early childhood education.

Amy's personal philosophy and attitude towards technology were impacted by her previous experiences and what she had observed for herself. She described herself as a 'proficient' educational technology user who could not manage without her mobile phone or her computer in daily life. However, her early experience in the online programme she had taken made her appreciate the importance of face-to-face contact. Compared to that online course, Amy considered the social relationships with her classmates in this one-year on-campus programme was supportive for her. She acknowledged the benefits of using technology while acknowledging shortcomings in applying it.

When she practised in the early childhood centre, she expressed that technologies could be attractive and effective teaching tools for the children. She also used technology, for example the television, as a 'babysitter' to keep the children occupied while she did tidying up. However, she also claimed that children in the centre should spend more time playing outside or playing with other children rather than simply watching screens. On the one hand, she considered technologies as effective learning tools for herself and attractive teaching materials for the children. On the other hand, Amy thought that face-to-face time with lecturers and classmates was important to her, while children in the centre should explore more than just connecting to technologies.

ii. The problem of enactment

This diploma programme is fairly intensive. Amy recalled her one-year learning journey in chronological order with words and brief strokes as following (Figure 5.3). At the very beginning, Amy was under extremely high pressure and worked hard. She almost cried when she did her assignments as she had no confidence in her study. In her first practicum, she felt happy with children and she was conscientious in that she kept diaries every day during that time. In the second term, Amy felt better adjusted with less pressure. However, she still worked hard and had to do assignments past midnight sometimes.

The second practicum was the most exhausting one. Amy expressed that her lifestyle turned into a *'hard mode'* and during that time, she felt too tired. Amy felt so stressed that she applied what she learnt from a Health course, such as meditation and the knowledge of holistic well-being, to her own situation to balance her life and holistic well-being, including physical and emotional well-being. Then in the last term, Amy felt happy even though she still had much homework to do. On the one hand, she gradually accustomed herself to study life. On the other hand, she was happy in her personal life with new friendships.

The third practicum was the most unnerving one since the associate teacher's requirements were rigorous. She was so stressed at the beginning of the practicum that she had a phobia of not wanting to go to work on Mondays. However, this feeling passed as she became more accustomed to practicum and felt better. In fact, Amy is considering applying for a job in the kindergarten after graduation.

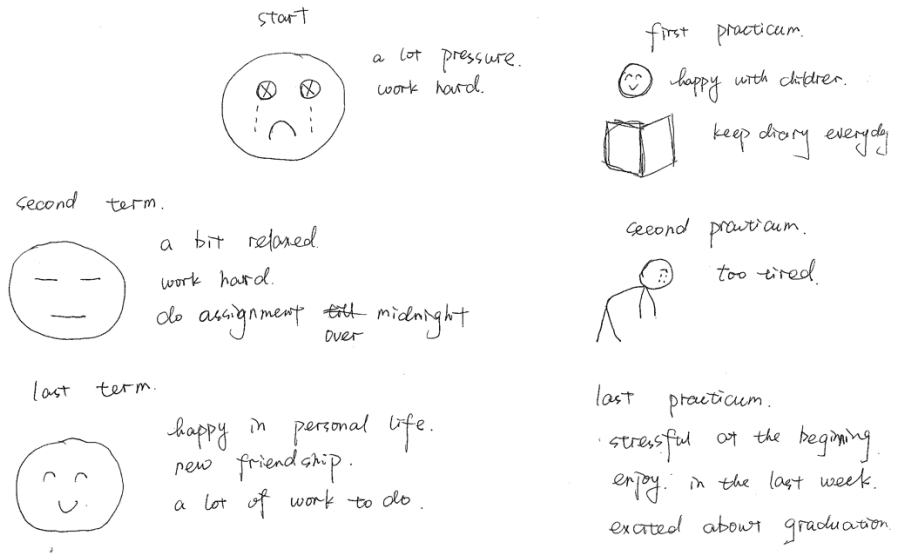

Figure 5.3. The process of the one-year learning journey – Drawn by Amy

From Amy's point of view, her learning process was an emotional process during which she experienced emotional ups and downs. Even though she experienced stress and tiredness, Amy still cherished her learning opportunity. Rather than just completing the assignments and passing the examination, Amy wanted to learn the knowledge and apply it in practice. She studied very hard with high attendance. In her perception, she could not understand some student teachers' absences from the course.

> *I think that some students have a very distorted view of the courses. The purpose of their attendance seems to be for completing assignments. Some of the students didn't show up to the courses when the deadline for the assignments approached. They just skipped the lectures to do their assignments. I feel that even though it is stressful before the deadline, as a student, you shouldn't skip the classes. I always feel that you didn't pay your tuition fee for doing assignments. It's more meaningful when you come to lecturers…It's a pity for them. You see, our tuition is super expensive. What a pity if you don't show up in the classroom.* (A2-9)

This problem of enactment is not only about translating the theory learnt in university into practice in an early childhood setting. This problem is also about putting the students' theories into practice. Amy claimed that her personal philosophy on children's usage of technology is that she would suggest children explore more and connect with others face-to-face, rather than

merely watching screens. However, she cannot deny the attraction of children to technologies. When she was occupied with tidying up, she had to permit children to watch TV to keep them well-behaved.

iii. The problem of complexity

There was a variety of influential factors in the learning process. When Amy reviewed this one-year programme learning journey, she listed some important factors and put the course study and practicum as the most significant factors for her.

> *I put the course study first. Because I think I learnt a lot of theory knowledge from the courses, and then I know better about what kind of ability that I should have to be a qualified teacher. Then I put the practicum in the second place. I think that the course study and practicum are the two most important factors for me this year.*

Amy also named the associate teacher's impact on her during the practicum.

> *Then, the associate teacher in the practicum is also a great influence on me.*

Comparing the learning journey in New Zealand with her previous learning experiences in China, Amy expressed the importance of her personal philosophy.

> *Then it comes to my own educational philosophy. Because I used to think that I didn't have any ideas about my own educational philosophy. Back in China, I used to think that teachers just should know how to reach the government's requirements. And everyone's philosophy is the same as the government required. It didn't emphasise that I should have a personal philosophy. But in New Zealand, personal philosophy is quite emphasised. I think it is quite important.*

Amy truly thought highly of personal pedagogy and philosophy. Furthermore, she considered that course study and practicum worked together to clarify her understanding of early childhood education.

> *Although I had previous working experience in centres, I hadn't studied the theory before. So it seemed that your practice was without theoretical support. I might have encountered some problems in the process of practice before, but I didn't know how I should figure it out. Then I did not think about it very deeply. But after learning these lectures, I discovered*

that our practice actually could be supported by theories from different perceptions. And then we could form our own pedagogical philosophy. (A3-2)

Amy also admitted the critical role of her classmates as well as the lecturers.

Then I think the influence of my classmates on me is equivalent to the lecturers' since I spent more time communicating with my classmates. Although lecturers did deliver quite a lot in class, I spent more time with my classmates.

For Amy, English as her second language could be a challenge as well as an advantage during her learning and teaching process.

Then I list the linguistic factor. It was a challenge for me on the one hand. For example, when I attended a class or when I wrote my assignment, I should say English as a foreign language might be a challenge for me. But on the other hand, it is also an advantage for me. For example, when the kindergarten teacher met some Chinese parents or Chinese children, Mandarin as my mother language is my advantage. This situation happened quite often.

Then the other factors such as the education environment, diploma certificate, academic performance, are almost the same in my point of view. They did have some influence on me, but not that important to me. (Retrieved from focus group interview, page 3.)

Learning to teach is an incredibly complex process. Amy explained the various influential factors above that student teachers had to deal with in the multifaceted nature of teaching. For Amy, a Mandarin-speaking student studying and teaching in New Zealand educational settings, the cultural difference could be added to the problem of complexity. Through the practicum, Amy expressed her feelings and perspectives towards the difference between the contexts of New Zealand and China.

I think that when it comes to the aspect of early childhood education, the concept in China is quite different from what is in New Zealand. For example, in New Zealand, it has a very liberal and open education system…But in China, when we talk about early childhood education, you know, children have to learn a lot in kindergarten, including Chinese and math. The requirements for early childhood teachers are very strict in China. The early childhood teachers in China have to master singing and dancing beside the basic knowledge. And they must also learn how to play the piano. I think this is very interesting.

Why do the teachers have to play the piano? On the contrary, teachers in New Zealand is relatively more diversified…What matters in New Zealand is your education concept in your heart, your own character and your understanding of education. This is very important. (A1-5)

From Amy's point of view, teacher education in China might focus on cultivating the basic skills and core competencies while in New Zealand, the main focus was the student teachers' dispositions. She believed that the character and philosophy of the teacher were more prominent. There might be a 'culture shock' between two different contexts for Amy. However, through experiencing the different culture from China to New Zealand, Amy could better compare the difference and form her own opinion.

As it has been rainy the whole week, children cannot play outside. I hope to make something different for them to play inside. Seeing that children love water play with sea world toys but water play is not allowed during these rainy days, I planned to make a sea world for children with a blue paperboard, and some crepe paper on it. And I also thought about making it into a messy play, but I was not quite sure about the idea. However, when I showed it to my associate teacher and asked about whether we could do some messy play inside or not, she agreed to my idea and encouraged me to use some flour from our centre. When I was preparing for the play, children were excited around me, so I asked them what could we have in the sea world. They said fish, shark, shells and so on. Therefore I found some sea world toys and shells for them to play with. Although there must be a lot of cleaning work after messy play, I'd love to try my best to provide a meaningful and enjoyable learning environment for children. Most Chinese parents would not be happy to see their children get messy or dirty clothes because of play. Their requirement may restrict children's learning experiences. Children are able to experience sensory learning, science learning, and physical development in messy play. After the activity, my associate

teacher told me that we could have more messy play with flour, oil, cornflour and something like that. (R: A-1-6)

Figure 5.4. Photograph supplied by Amy, taken on 8 March, 2017

From her practicum, Amy also reflected on the cultural differences between what would have been appropriate, acceptable and required in China and what was expected in New Zealand. This was the most significant gap between what she had previously understood and what she now wanted to put into practice. Amy reflected on these cultural differences and put her philosophy into practice during her practicum.

Conclusion

In conclusion, Amy's journey of learning to teach has been mediated through multiple lenses. She has been motivated by her prior enjoyable experience with her niece to study early childhood teacher education and supported by her family to pursue learning opportunities overseas. Language is an enabling constraint in her learning journey as a Mandarin-speaking student. Rather than online learning, Amy prefers to study together with peer students and teacher educators face-to-face as she believes it is important to keep social connections with others. In the early childhood setting in New Zealand, Amy also maintains the underlying belief that it is beneficial for children to keep social connections rather than spend time on screens.

Chapter 6. Ben's Journey

6.1. Who is Ben?

a. Background

Ben is a 31-year old male student. He was born and raised in South China, in a small country area. He has four elder sisters, which makes him the fifth child and the only male child in his family. Until recently, in some rural villages in China, people would prefer to have at least one son rather than any daughters. Sons had the duty to produce offspring and bring glory to the family. While equality between the sexes has been widely acknowledged, the traditional patriarchal ideology still persists in some people's minds in China.

When Ben was in secondary school, he began to take care of his nephew. As they grew up, Ben explained, he was like a role model for his nephew and they became very close. Ben's parents were not well educated and they could not help Ben with his studies. Through caring for his nephew and being successful in his studies, Ben gained trust from his family. To a certain extent, Ben grew up independent and organised.

Ben was a smart student with excellent academic achievements. Compared to his sisters, Ben attained the highest level of education. He was the first child in his family who had the opportunity to study in a university. It was a source of pride that he had been able to go from his small home village to a high school in a local town and then gain access to a favourable university.

> *I am proud to say that I gained access to go to the high school given the condition that not everyone was able to do so. 90% or 80% of the secondary school students have no way to go to high schools. Because after you graduated from secondary school, you were already 16 years old. Most of the time, when you were 16, you were able to go to work. After studying in the town, it is a bit better. Students in the high school of the town are basically able to go to university. Yeah, I think I'm proud of myself being able to go out of the countryside.* (B1-5)

Ben was honoured that he went to high school outside of his village and then to university out of the province. This was not an option for the majority of students. In fact, very few were able

to obtain further education. When Ben was in high school, he only went back home twice a week from school because of the distance involved. Ben remembered his success in school English.

> *Before second grade in high school, I'm particularly good at English. And I'm actually in the first place in the whole school. Well, I mean in the important exams. I'm not the kind that I can guarantee to always be in the first place. But for example, in the exam transferred from the first grade to the second grade, which is a clear, very important exam in the high school, I was the first place in that English exam.* (B1-5)

Ben got his bachelor's degree in English from an international studies university in southwest China. After graduating from university, he worked in a printing machinery factory. When his mother became sick, he quit the job and went back to his hometown to take care of her for about one year. Then, he went to Beijing and worked as an English teacher in a private institution for seven years. The reason he gave for choosing to work in Beijing was that his three best friends were there at that time. However, the managers and colleagues in the language institution only cared about making money and did not care about each other. The lack of support was the main reason that he decided to leave Beijing and study abroad. He arrived in Auckland five days before the programme's Induction Day. Although Ben had travelled to other places in the world, he had never been to New Zealand. Ben called himself a gipsy, who was a free-spirited person and seemed to always be on the road.

More than just a communication tool, language is related to one's confidence and self-identity. Ben was born in a remote village where the villagers spoke the local village dialect. When he entered his high school in town, he found that the teachers and students there all spoke the local town dialect. These two dialects were quite different according to Ben's experience. In general, economic development increased from village, to town, to city. Therefore, the town's educational level was better than the village's. Ben was one of the few students from a small village who could enter high school in a town. On the one hand, he was proud of himself to be able to achieve the scores to further study in the town. On the other hand, as Ben recalled, he felt self-abased since he was from a small, remote village. He believed that other students might think of his dialect as countrified. Therefore, he spent almost half a term's time to learn the town dialect, not because they could not understand his dialect, but in order to assimilate into the new school. Then Ben entered a university in another city. This time, he rejected learning the city dialect. Now that Ben lives in New Zealand, he claimed that he would not change his

English accent into Kiwi English deliberately. As Ben explained, he gradually built his confidence after graduating from high school.

To Ben, the language was not only the communication tool but a representation of identity which contained one's prior experience and was a mirror of who you were. When he was in high school, he was not confident of his background so he changed his dialect to try to change the truth that he came from a village. As he became more confident, he did not need to change his dialect deliberately to imitate and please others. As Mandarin-speaking students study in English in New Zealand, English is their learning and living language. It helps them to immerse and integrate into New Zealand's learning and teaching environment. Their mother tongue Mandarin, on the other hand, helps them to build confidence in themselves and to recognise others who speak Mandarin.

Ben described himself as a late adopter of using mobile technologies. During his schooling, few technologies were used. He owned a mobile phone when he was in university. Now, he owns an iPhone and a MacBook laptop. Ben recalled his memories of communicating with his best friends from his primary schooling to his time in university. When he was in primary school, the connection between himself and his best friends was through the daily commute to school. Ben walked by his friends' houses and shouted outside the houses, and then, they would walk to school together. When he was in secondary and high school, their friendship was maintained through visiting each other on weekends. When he was at university, Ben and his best friends kept connected through making phone calls. Now, Ben uses his cell phone frequently, usually using WeChat to communicate with his friends. He rates himself as a basic user of educational technology. However, he thought of himself as *'reluctant'* to use technologies and described technologies as *'cold'*. Ben claimed that he was risk-averse in using technology. He was used to reading paper materials since he did not like to read on screens. He preferred to connect face-to-face. He also claimed that he was short of technology skills.

> *Personally, I'm not good at using technologies. If you say something complicated, I think it's too much trouble. I'm too lazy to get involved with the computer's software. For example, if the flash is not working, I don't care too much about that. As long as it won't affect my using and my computer is still working, I could use it to watch videos. If the flash is broken while that software does not require flash, then I could just use that software directly without bothering to learn how to fix the flash.* (B1-15)

In Ben's case, he utilised his phone often. He liked to share his thoughts through words, sometimes via pictures, with his friends on WeChat or through blogs. Even though he claimed he was reluctant to use technologies, using it daily was already part of Ben's life. He merely took the basic use of technologies for granted. However, with regard to unfamiliar technologies, such as a new application or software, Ben would rather not try them. He did not want to risk trying new technologies. Ben expressed his reluctant perceptions of some unknown technologies through an example of watching a video on his laptop. Ben would not bother to download or set up a video player to watch a video. Firstly, he considered the download and set-up process as an unfamiliar and challenging problem that he did not want to take the risk to explore. Secondly, he believed that there was always another way, a familiar way, to solve his problem. For example, he could search other video sources and watch the video online to escape downloading any other programmes.

b. Motivation and aspiration

Ben was tired of the indifferent atmosphere of his teaching job in Beijing and decided to quit the job and study further abroad. It was one reason that he made his decision to leave Beijing, where he had been living for seven years. Other reasons included that he was tired of the terrible air quality and could not afford a house in Beijing. Ben wanted a change. He wanted to get rid of the hopeless feelings he had about his future. As for the choice of New Zealand, Ben said it was out of financial consideration. The study fees in New Zealand seemed fair enough and he could complete a diploma in only one year. Another important reason was that he had a friend who was working in an overseas education consultancy company in New Zealand. The friend, who had helped and guided many students to study overseas, recommended to him that he study early childhood education here in New Zealand. In Ben's own words, *'Life takes me there'* (B1-8). As Ben reviewed his personal learning story, he mentioned that he did not have a plan at the very beginning. It was what he had been through that drove him to where he was. As a gipsy, it was his fate to wander around.

As he recalled, Ben's interest in working with children could stem from his youth. With four older sisters, he had many nephews and nieces who needed to attend. When Ben was in secondary school, his oldest nephew was around two years old. Every day after school, it was Ben's job to cook for his nephew and then give him a bath. With that experience, and others, he found himself enjoying being with children.

When it comes to the choice of early childhood education as a pathway in New Zealand, Ben explained that he did think about teaching in a primary or secondary school. However, teachers in primary school usually should be able to teach two subjects. Apart from Mandarin, Ben could not find another subject to teach with confidence. That was one reason why he had chosen early childhood education. Even though it is widely acknowledged that it is easy to find jobs after graduation as an early childhood teacher, Ben did not say that was a reason. The most important reason that he selected early childhood education as his pathway was that he loves being with children.

> *I can teach English to earn money but teaching in kindergarten is probably what I would do as a career of mine.* (B1-6)

> *I think I really don't want to see someone in the kindergarten whose heart is not there. This is unfair to the children. You don't mean to be with them. You don't want to teach them something. You are there only for yourself. Even if you get wages from that job, you don't work for the children. I think this is unfair to the children.* (B1-9)

Ben's motivation to be an early childhood teacher was very much a calling or passion. He wanted to *'be with'* the children, teaching them with all his heart.

c. My impressions

Ben was successful in school English and majored in English at university. He has been an English teacher for seven years. He is confident and fluent in English which enables him to study and live in New Zealand, an English-speaking country. Although Ben attaches great importance to family and friendship, he had made the decision to leave them to study and retrain as an early childhood teacher. He pays attention to relationships and connections with the people around him. His enjoyable prior experiences with his nephew impacted his choice of being an early childhood teacher. He would like to keep a good relationship with the children and teach them with all his heart as an early childhood teacher.

Ben described himself as a late adopter of technology and expressed reluctance to use technology but he often uses technology in his daily life to share his experiences and keep connected with others.

6.2. Ben's Learning Pathway

a. Campus-based – technology for learning

Over the course of Ben's year-long study, I had the opportunity to watch him in classes, interact with him via WeChat, interview him, and read his reflections. In this section, I have included what Ben wrote as his typical daily schedule. During term time, he was attending classes for most of the day and tutoring in the evening. I have created two scenarios based on my observations and notes to give a sense of what Ben's presence on campus looked like to me. I comment on these scenarios and then introduce the importance of technology to Ben.

Daily routine example (Retrieved from focus group interview, page 11)

8.00a.m. Walk to university

8.30a.m.-12.00p.m. Lecture

12.00p.m.-1.00p.m. Lunch

1.00p.m.-3.00p.m. Lecture

3.00p.m.-3.30p.m. Go home

4.00p.m.-5.30p.m. Assignment

5.30p.m. Dinner

7.00p.m.-9.00p.m. Tutor (teaching English online)

Scenario one

It was 8.30 in the morning. That day's lecture began with a warm-up singing a Maori song. Ben used his iPhone to record a video of the song sung by the students and the lecturer. Then, the lecturer organised a group energiser game. While all of the students stood in a circle holding a small object such as a pen in their hands, the lecturer would read a story including words like 'left' and 'right'. When the students heard the word 'left', they had to pass their object to the student standing on their left. When they heard the word 'right', they handed it the opposite way. The game could also be played in an early childhood centre with the children. After the game, the lecturer explained the requirements of the next assignment and then taught new content. During the class, Ben found an unknown word. He looked up that word with his iPhone. Ben had downloaded a Dictionary application to his phone to look up English words. After the class, Ben shared the video he took in the class on his WeChat Moments. It was not only a share of his daily life but

also a record of his learning journey. (Based on field notes of an observation on 23 March, 2017.)

Scenario two

It was nearly 8.30 am. Ben walked into the classroom with a coffee in his hand. He found an empty chair in the back group. As he planned to sit down on that chair, the guest lecturer reminded him that it was better to sit in the front groups to see the PowerPoints clearer. Ben moved his chair into a front group. After he sat down, he opened his MacBook and downloaded that day's PowerPoint from Canvas. At around 9.40 am, Ben took a picture of the PowerPoint shown on the screen with his iPhone. That day's lecture was mainly an introduction of a series of history books. At the end of the class, the lecturer gave some feedback about the most common questions on the Canvas discussion section. Ben walked out of the classroom chatting happily with two other students. (Based on field notes of an observation on 18 September, 2017.)

Scenario one is a classic example of Ben's use of technology to record an experience during face-to-face lecture time when he recorded a video of the Maori song. Scenario two, based on Semester two, reflects Ben's daily use of his laptop and iPhone in the class. He records and shares his learning moments through technology. He also uses technology to check words, takes photographs of PowerPoint slides, and access Canvas. Ben is a reluctant user but he uses technology all the time to stay connected and to help him with his studies. In this section, I will focus on Ben's learning journey, based on campus, embedded with technology.

i. Ben's use of technology for connecting with others

At the beginning of the programme, Ben was fairly occupied sorting out his accommodation and shifting into a new learning environment. He had arrived in New Zealand just five days before the Induction Day of the programme. So as well as starting learning, he had to settle down in a new city. One of the most important and urgent matters was to find a place to live. Ben did not have a car and could not drive; therefore, he wanted to search for a room which was not far from the campus. He searched apartments online through websites such as Trade Me.[17] He also posted an advertisement calling for flatmates in the WeChat ECE group. As a

[17] Trade Me is the largest Internet auction website operating in New Zealand.

result of this online activity, Ben found a room to rent around a 15-minute-walk away from the campus.

As the programme progressed, Ben gradually felt the pressure of studying increase. After Term 1, when he had time to take a break, he began to adjust to studying and living in New Zealand.

> *At the beginning of the programme, we were driven crazy by the assignments, but suddenly, we are too boring now. As you could see in the WeChat group, we were saying that we could not live without assignments.* (B1-1)

Ben expressed that he felt pressured at the beginning of the term but idle during term break. Since he simply started getting used to the busy schedule of the first term, a disengaged break was suddenly boring for him.

> *I just forget about how painful it was before. Since it's not busy now that I just forget that I've been under so much pressure. Now I feel like it seems that I haven't been under pressure. But back to the first month of this term, I had no idea how to write my assignments and almost dropped out*. (B1-2)

> *During that time, we were all truly busy. It is not to say that we did not want to have a talk with you, nor did we say that we couldn't really pull out that one hour in our life. It was the kind of mood you knew. Even though I might do nothing in this hour, I still couldn't do anything other than assignments.* (B1-3)

At the beginning of Semester one, when I tried to reserve a date to interview Ben, he declined because of too many assignments and too much pressure; he could not spare the time and did not want to talk. In this instance, Ben and I arranged another date, generated data through short conversations after class observations, or through WeChat rather than a formal interview. As a bricoleur, I wanted Ben to share his story with me voluntarily rather than take the interview as a task or assignment to complete. This study pressure impacted on both Ben's learning journey and my research process with Ben but technology afforded an alternative way to be connected. I had access to Ben's social media to see his sharing of his learning journey, and to have short conversations with him.

During this term break, when Ben reviewed what he had done in Term 1, he also altered the expectations of his learning outcomes.

At the beginning I meant to get a C then I would be very satisfied. But now since I already got two A-, then I wish I could get all A, including A-, on my transcript. (B1-1)

After Ben received two results of his assignments in Term 1, his confidence was bolstered and he decided to aim higher. Even though he felt stressed over the past three months, he would continue studying hard during the following terms.

Ben shared his feelings, experiences, and his ups and downs through the ECE WeChat group. As a non-native speaker, Ben sat a Diagnostic English Language Needs Assessment (DELNA) Screening test on the Induction Day. The test is a computer-based assessment and consists of vocabulary and timed reading tasks. Later, in the WeChat group, he expressed his disappointment that he had failed the DELNA Screening test. He typed two lines in the ECE group, stating *'Assessment failed'* and *'IELTS reading band 9.0'*. Since he had studied English as his major for four years in university and got 9.0 in IELTS reading, to some extent, he had confidence in his linguistic competence. When he failed the DELNA Screening test, he felt upset and surprised. However, knowing that some other students had also failed cushioned the blow. Other members in the ECE group told him that there was another DELNA Diagnosis test following if he failed the Screening test. The Diagnosis was a thorough assessment of students' English language skills done with pen and paper within a two-hour timeframe. After hearing other classmates' advice, Ben decided to work on the Diagnosis test and encouraged himself in the WeChat group by stating *'Atta boy!'*. Around ten days later, Ben shared the news that he got the email and had passed the DELNA.

Ben was active in using social media. Ben used WeChat frequently. He updated his WeChat Moments[18] almost every day, sharing photographs about his daily life as well as texts about his feelings and thoughts. He also posted frequently in the WeChat group, sharing course information and reflections about tasks, asking favours of other classmates, as well as offering help to others. The Mandarin-speaking group members shared the same language and similar cultural backgrounds. It formed an affinity group where Ben preferred to share his feelings and experiences. He shared his empathy and understanding with the group which helped relieve his stress and disappointment. Ben wants to connect with people around him and this affinity group affords him the social connectivity, sharing care, and support.

[18] 'Moments' is WeChat's social feed of friends' updates. Moments allows users to post images, post text, post comments, share music, share articles, and post 'likes'.

Ben used the WeChat application to build a sub-group with close classmates. He invited another two classmates from the WeChat group, who would like to study together in the library after class, to set up a sub-group. Along with Erica, who was one of the creators of the WeChat ECE group mentioned in Chapter 4, and another female student, Ben built an exclusive sub-group that consisted of three members. More than a co-study group, these three student teachers also 'gossiped' to relax and shared personal feelings with each other. They built up a close friendship through this sub-group.

Based on his previous experience with social media, Ben believed that it was not difficult to start to use similar applications such as Facebook. He thought it might take more time and effort to become acquainted with unfamiliar technologies though. Ben explained that he had to open an account on Facebook in order to join the ECE Facebook group and figure out how it worked before he could be active in the ECE group. However, he managed to do this fairly quickly because of his previous experience.

ii. Ben's use of technology on campus

Ben used technology to record and share his learning journey throughout this programme. As mentioned above, he updated his WeChat Moments to share his daily life and learning moments. Ben also used an e-portfolio to record his learning progress which doubled as a comprehensive curriculum vitae.

> *As for the e-portfolio, in the future we may go to other cities to find a job, then it is not convenient for you to bring a portfolio. You could just send this link to the employers and then they will know all of your information. It's more than a CV. There could be many photos in this e-portfolio. There could be reflections written by us. You can put all of them in. And you can also put your assignments and your academic achievements. These things can all be put in.* (B1-2)

With the e-portfolio, Ben could save various materials in diverse forms, such as photographs, reflections, and academic achievements. This e-portfolio was stored as a digital version which was portable and easy to transfer.

Ben collaborated with other students who were studying, through technology. Besides the sub-group that Ben mentioned to organise studying together and keeping connected with close friends, Ben also referred to a specific application, Google Docs, as an example to highlight his use of technology in collaboration with his classmates.

> *With Google Docs, it's like drawing a painting. It needs everyone's cooperation. It won't work if you paint your painting while I paint my painting, and then just put it together. It needs everyone's cooperation. You draw a stroke and then I draw a stroke.* (B1-14)

Though Google Docs enables students to work on the same document at anytime and anywhere, Ben pays attention to the students' cooperation process. Ben objected to students individually finishing their own part of the work then compiling the different parts into one piece in a collaborative work. Ben highlighted the communication with others and the cooperation process through the collaborative work.

Ben mentioned his problem with reading the assignment feedback through Canvas. Ben could not open the feedback file with his MacBook. Instead of figuring out how to open it on his computer, his solution was to use the library computers. Ben did not know whether it was his laptop's problem or it was the difference between iOS and Windows system. He claimed that since he was not good at technologies, he intended to solve the problem in a direct and easy way. Ben never asked others, such as the IT support team, to solve this specific problem. He claimed he could not be bothered using technology that did not work easily and seamlessly but he was not reluctant to attempt new technologies.

iii. My impressions of Ben's use of technology for his learning

Ben was using technology all the time and could see the benefits of technologies. He used technology to connect with me, his friends, and people around him. He also recorded and shared his learning journey via technology and collaborated with other students through technology. Even though he had not used Google Docs before, he found it was easy to learn to use it. It was helpful and convenient to cooperate with others and share ideas through this platform. Ben could use technology to engage with other students in a meaningful way. Technologies used in his learning journey did make his study more convenient and interesting. For example, the folk songs played by the computer during one class enriched the content of the course and energised the atmosphere of the class. Ben made use of tools and technologies to suit his requirements. He prioritised communicating with others in the class regarding assignment work and connecting socially with other (particularly Mandarin speaking) students.

Ben also recognised his low-proficiency in using technologies. He acknowledged that he was not technologically savvy. He claimed that he did not even download the Word programme on his laptop because he considered the set-up process was too complicated. Another reason was

that he did not need to use Word since he could do his assignments through Google Docs. He was satisfied with what he could use and avoided attempting new technologies. Ben's approach is typical of when students are accustomed to a specific technology device the familiarity might constrain the learner's use of other technologies.

b. Practicum-based – technology for teaching

While Ben was on practicum placements, he kept writing reflections of his daily activities. He was also required to complete assignments which he shared with me. He spoke to me over coffee. I interviewed Ben shortly after each practicum visit and recorded notes in my journal. In this section, I have included what Ben wrote as his typical daily schedule and two of Ben's reflections from different practicums to give a sense of Ben's experience on practicum. I comment on these reflections and then draw on other sources of data–Ben's interviews with me and his assignments–to discuss how Ben's learning journey as a teacher on practicum unfolded with technology.

Daily routine example (Retrieved from focus group interview, page 12)

8.00a.m. Set up

9.00a.m.-10.00a.m. Mat time

10.00a.m. Morning tea

12.00p.m. Tidy up & lunch

1.00p.m. Play outside

2.00p.m. Mat time

3.00p.m. Go home

7.00p.m.-9.00p.m. Teaching English online

Reflection one

> *This noon, we all heard a girl suddenly crying loudly on the monkey bar. Rose, about 3 years old, got stuck there and she was about to fall. The teachers were approaching her, but they seemed not very worried. I went to her very quickly and carried her down to the ground. She stopped crying immediately.*
>
> *The teacher, Robert, came to the monkey bar and he smiled and said: Ben, could you put Rose where she was? I was confused, but I did what he told me. Rose seemed worried, but*

Robert went to instruct her how to get down by herself, and she made it this time. Now it was Rose's turn to smile.

On reflection, we were told to keep the children as safe as possible when I was teaching in China, and my students were teenagers. When things like this happened, my instinct was to help children get out of the situation (danger) as soon as possible. Nothing was about teaching, because it was all about nobody getting hurt. We might think about it later and tell the children about the danger, but we never tried to get to talk about how to face the similar difficulties. Even when I was facing teenagers, I have to admit that I was not treating them as competent people because everyone around me was treating the students, even teenagers, as people who need to be carefully protected. (R: B-1-1)

In Reflection one, Ben reflected on his experiences and understanding of protecting children from dangerous situations. By contrast, he recorded that the teacher on his practicum encouraged the children to explore the situation themselves under teachers' guidance. He compared the difference between two cultures of protecting children from any danger with guiding them to explore the unknown situations.

Reflection two

It was my opportunity to do the mat time today. I decided to teach the children to sing a Chinese greeting song. The lyrics have been on the wall since I arrived and my AT says they wanted to do it but they do not have enough knowledge in the language of Chinese.

During the mat time, I tried to lead the children into singing with me, but most of them were sitting there and observing me. After having been invited and encouraged several times, some children began to sing but for most of the time, it was only me and my AT who were singing. (R: B-2-4)

Come to think of it, I had an experience like this when I was in primary school. Out of the blue, my Chinese teacher asked me to write from A to Z on the blackboard one day, but I had zero knowledge of English at that time. I went up to the front of the class and stood there, being embarrassed. I know the children there, sitting on the mat, were not embarrassed but I think that they are very likely to feel strange and probably uncomfortable. (R: B-2-5)

When Ben taught the children to sing a Chinese song, he recalled his own memory of learning a new language to understand the children's feelings from a student's point of view.

The reflections and schedule above help to get a sense of what happened in practicum through Ben's lens. In the following section, I have explained Ben's journey on practicum, embedded with technology, based on the data from his reflections, assignments, and our conversations.

i. Ben's use of technology to connect in early childhood centres

Ben highlights the importance of connecting with children. From Ben's background and motivation information, he wants to *'be with'* children. He collected activities and experiences from campus study to use when he was with children. For example, he recorded songs in class not to show the children but so that he could learn the songs and sing them together with the children in his teaching. In Scenario one, they played a game in the physical classroom space that Ben thought could be used in the early childhood centre. Ben used technology to build his own repertoire of things to do with children.

Ben also used technology to capture moments which were important to him and fed into his way of wanting to be a teacher that is with the children. Ben uses social media to capture his learning journey and share his daily life which later sparks his intention to use technology to capture the children's learning stories to share with them and their parents. Ben used a camera to take photographs for the children's learning stories as memories for the children and shared them with their parents. During the practicum, student teachers needed to write down children's learning stories, usually with the help of a camera and a computer.

> *It's a record of children's growth. If you think about it, it's actually very interesting. The children's stories will be forgotten by themselves, but we will help them to record this in the form of photos and texts. When they cannot record, we help them to record their learning and growth. What they have done are like milestones. So it's quite interesting. And the children here are very fortunate to have their own learning stories.* (B1-2)

Recording children's learning moments and their study milestones was a meaningful use of technology for Ben. It enabled an interesting way to record and share the children's learning journeys and kept the connection between Ben and children, children and parents, as well as Ben and parents.

ii. Ben's use of technology in teaching

When asked about technology in his own campus learning for this research, Ben identified technology as digital technologies, such as cell phones, computers, and related digital devices. However, when it came to technology in early childhood centres, Ben made a more general reference to technologies that included computers, radios, Lego, puzzles, and even a pen. From Ben's point of view, the process of using some kind of tool, such as a pen, to achieve a purpose, such as writing, could be seen as a technology.

> *As for what we used in the centre, I think Lego is a technology. And the puzzle is definitely a technology. Because the puzzles are not hand-made. Those clays, and a kind of pigment that the children can even eat, these are all technologies…In my point of view, I think all of these are technologies. They might be divided into, such as modern technologies and general technologies. We may usually use general technologies. For example, fruit and the kind of organic fruit. Yeah, they are all fruit. Fruit is fruit.* (B1-13)

He did not mean to confuse the concept of digital technology. He used a metaphor of organic fruit and fruit to describe his understanding of digital technology and modern technology. Besides digital technology, he merely wanted to emphasise the importance and possibilities of a variety of educational resources in early childhood education.

From Ben's point of view, he would pay more attention to communicating with children and how to teach them instead of using complicated technological tools. Ben referred to one of his lecturer's comments *'If you don't know what to send to a parent of a newborn, you could send them a piece of cloth'*(B1-17). With a piece of cloth, there were a variety of ways to play. The children could develop their imagination and creativity. This was unlimited. He believed that simple tools could also be helpful for children.

> *I personally don't agree to give the iPad to children. Because when you play the game [on an iPad], your thoughts are really restricted. Because it gives you too many rules. I was greatly inspired by that day. I don't know if it's related. That is to say, when you are given a simple toy, then usually you can play with it for a long time. But sometimes, if I give you a very complicated and expensive toy, which stipulates that you can only use the designated buttons, I don't think that's beneficial to your thinking training. I still don't like to give a lot of technologies to little children.* (B1-16)

For example, this reminds me of my childhood. It was long ago. On a winter morning, while my mother already got up and was in the kitchen, I was awake but didn't want to get up. Seeing the various lines on my sheet, I began to make up stories in a variety of ways in my mind. Such as how to walk along the lines or somebody picked up something between the lines. See, you just gave me a sheet, then I could compile countless stories of it. I could create. Compared with playing a computer game, such as how to win the game, it's already designed. But my make-up of the story is open and creative, in Mandarin as 'undesigned'. (B1-17)

Ben recalled a childhood memory, as an example, to express his emphasis on connecting with children to inspire their creativity rather than occupying them with complicated tools or technologies.

Ben's attitude towards using technology is complex and paradoxical. On the one hand, he acknowledged the usefulness of technologies and embedded technologies into his practicum. On the other hand, Ben claimed that he was reluctant to use technologies since they were impersonal. Ben's perspective of using technology could be described with his own word– *'reluctant'*.

In some centres, the teachers don't read the storybook manually. Unexpectedly, they put a DVD on to tell the story. I think it's unprofessional. (B1-15)

I think that if technology reads the book, there is no warm. The story itself, without teachers' interpretation, has no 'warm'. I think if there's a teacher reading the book to you, then there is a kind of contact. I can pause at any time to interpret. There are contacts between the teacher and children. For example, there's a teacher in our centre. When she reads to the children, she would pause at some points and communicate with the children then carry on reading. There were some thoughts and ideas to inspire the children. If the story is told by a computer, there's usually no pause. The child would just listen to it without thinking, wouldn't they? While a teacher could throw out questions to the children constantly. Then the children could have their own thinking and ideas. I think they could learn from this. We can't just say that technology is good at everything. (B1-15)

Rather than use a computer or iPad to play a story recording to the children, Ben preferred reading the story himself. During his reading, he could pause and mutually engage with

children to inspire their thinking and creativity. Ben wanted to *'be with'* children and to connect with them face-to-face which impacted his reluctance of using technology.

Ben's use of technology in centres was influenced by the ease of access, the convenience and the seamlessness of using technology. He was also concerned about and children's privacy.

> *In kindergarten I could use computers. Now basically every centre has a computer because you need to write learning stories, and you have to take pictures. In my first practicum, the computers are all shareable. If you need to write learning stories you can write on that computer and insert pictures in the learning stories. There was one problem found in the centre that the camera is inconvenient to use. When I was leaving, they had a staff meeting and discussed that they would use shared mobile phones soon. The camera we used is kind of the oldest camera. It is inconvenient to export photographs. But if you take photos with a mobile phone, you can use Wi-Fi to upload pictures directly. Well, shared mobile phones in the centre rather than your own phone. Because the children's privacy is very important.* (B1-14)

Ben mentioned what he encountered as influential factors in using technology. For example, the centre's possession of digital technologies, the centre's regulations regarding the use of technologies, and the convenience of using them all impacted on student teachers' use of technology in their teaching on practicum.

iii. My impressions of Ben's use of technology for his teaching

Similar to Ben's use of technology to record and share his own learning journey, Ben used a camera to take photographs of children and shared the children's learning stories with their parents. Ben was using technology to make connections with the parents and to connect the children with their parents. Technology affords the ability to record, share, and connect.

Though Ben used technology to enable his teaching, he claimed that he was reluctant to use technology in teaching. He wanted to connect and interact with children face-to-face to inspire their creativity.

c. In retrospect – three fundamental problems in Ben's becoming journey

In this section, I have revisited Ben's journey mediated by three fundamental problems especially embedded with technology.

i. The problem of the ‘apprenticeship of observation’

Ben’s motivation for becoming teacher stems from his prior experience. Ben has mentioned his fond memories of being with his nephews.

Prior experience also helps student teachers to build a personal philosophy. For example, when Ben stated the advantages of simple toys for children, he mentioned a childhood memory of making up stories with a sheet. Compared to computer games, he stressed the creativity and openness he gained by using his imagination. In Ben’s mind, making up stories added a rich dimension to his storytelling. Ben loved reading. He had very happy and vivid memories of reading books in a book store in his teenage years. These still seemed fresh when he told me about them in his thirties. He preferred to read paper books rather than read on screen. Instead of playing a DVD to tell a story to children in early childhood centres, Ben preferred to read the storybook himself, turning over the pages while making eye contact with children. This brought back his positive childhood memories and he thought that children should also build memories like this. Ben’s happy childhood memories and positive, affectionate relationship with reading books might be the underlying cause of his belief that technology in an early childhood centre was not to be promoted as a great thing. These prior experiences in Ben’s childhood have influenced his personal philosophy of becoming teacher. They have had a powerful determinant influence on his personal philosophy even though they may have appeared as trivial daily occurrences to him.

Even though Ben believes that technology use in an early childhood centre should not be considered of great importance, he did use technology to take photographs of children and to share children’s learning journeys with their parents. Ben cherishes the connectivity between people. Since he uses technology to record and share his own learning journey, he could also see the value of recording children’s learning moments with technology during his teaching.

Ben’s memories of being a ‘good uncle’, a good ‘teacher in an English language school’, and his own memories of what he enjoyed and experienced as a kid weave together and influence him when he is becoming teacher. They are his default tapes, his personal set of biases, and the lens he sees his role as a teacher through.

ii. The problem of enactment

When considering the problem of enactment, Ben’s reflections of his time on practicum are very telling. He is a committed and determined young teacher who also sees his role as

protector and carer. Putting those two things together in the early childhood setting were tiring and challenging. As Ben reflected in the interview, enacting his beliefs and holding multiple roles was tiring. He said that teaching was exhausting but that working with children made it enjoyable. He wrote,

> *I was really tired. Because when you were in practicum, you needed to keep the children safe while at the same time you had to think about teaching them. When you were playing with them, you had to consider teaching them something. This could go even beyond your lesson plan. Compared with my experience of teaching English, I had a plan for what I would teach today and what I would teach tomorrow. While as an early childhood teacher, even though I'm not an early childhood teacher now, I think it's really challenging work. In the early childhood centre, you have to dig at anytime and anywhere to learn what you can teach and what you can do to help.* (B1-10)

In the early childhood setting, Ben wanted to act as a protector as well as a teacher. In his mind, the different roles were interwoven. However, there was a difference between the role of teachers in early childhood education in New Zealand and China. As he explained in a conversation with me, teachers in New Zealand had more trust in children and encouraged them to explore more.

> *Because our own background is to protect the child, isn't it? We will not let them expose to the danger. But here in New Zealand, we use the risk cream. We learnt that some tools were indeed dangerous to some extent. But if you have realised the potential danger, then that could be avoided. It seems that in China, we wouldn't let the* children *be close to the pan, in no way. Right? It's impossible to allow the* children *to be around the pan. It's absolutely impossible. But in New Zealand, while the teacher is in charge of the pan, then the* children *could also participate. The children would directly participate and make a cake using the pan. When they finish, they will eat it…Actually, this indicates our trust in children. Sometimes, while you take something as forbidden fruit, then the* children *really want to touch it. But when you trust them, they actually won't try that. This reminds me of my childhood. My family is indeed not in good financial condition. But my mother always put all the money in a drawer. Even if I need to get some money, I do not need my parents' consent. There is no need for consent because it is there. I suddenly realise my parents' trust in me. So in terms of money, I knew I had to have a financial plan from my childhood.*

> *My parents didn't teach me anything, but they gave me the trust that I can handle the money. They trusted me that I wouldn't spend too much or unreasonable.* (B1-4)

This learning story is a reflection of Ben's opinion on *'trust'* of children, which is similar to what he described with regards to the monkey bar episode in Reflection one. What Ben has absorbed implicitly through his upbringing is that young children learn through adults trusting them to do the right thing. This was lost when he was teaching English at the higher education place. There, they were expected to protect and shield the teenagers and adults. Here in New Zealand, he has been told to let the children learn for themselves, to let them experience failure, and to let them fall, if necessary, from the monkey bars. The teachers are there to teach, not rescue. Ben is grappling with these conflicting messages, wanting to teach and support learning in lots of situations, yet feeling conflicted because he also wants to enact this 'caring' role. He agrees more with the perception that teachers should trust the students and empower them to explore and learn for themselves. Besides having trust in children, Ben also reflected that through this practicum, he realised the children in the New Zealand early childhood centres were competent and confident learners.

Ben also commented that he was accepted and encouraged by the other teachers in the first practicum placement. This had given him a greater sense of belonging and purpose. In Ben's retelling of this story, he is obviously very proud that his intrinsic qualities were recognised from the very first day. The concern that he might not fit in with the others or be able to contribute in meaningful ways was eased. He found a way to enact his own beliefs and was accepted.

> *In the first week of my practicum, there was already more than one teacher in the early childhood centre telling me that when I graduate, I must give them a resume. This happened in just the first week. Then came the last week, the farewell. Even teachers from other sections, such as the baby section, the under the age of 2 section, who were not directly related to me, told me directly that, 'you have passed since day one', 'you passed this practicum in the first week'. And it was quite touching.* (B1-10)

While Ben is grappling with the conflicting philosophies with regards teaching as an educator and carer he is also conflicted with the use of technology. Ben wanted to enact the sort of pedagogy he believes in his heart. He was reluctant to use technology and did not want to become dependent on it. He believed that rather than playing an audiobook, reading a book aloud to the children could build more connection between them. He did not want children to

be addicted to technologies. However, some children did seem to prefer to listen to an audiobook and watch a video. When Ben was occupied with tidying up and managing the classroom, he also compromised by playing a video or an audiobook.

There was a gap between how Ben wanted to be as a teacher in an early childhood centre and how he actually enacted this in practice. This was complicated further by cultural differences. However, his way of being a teacher was reinforced by the acceptance and encouragement of the staff in the first early childhood centre.

iii. The problem of complexity

Ben believes that his words are more powerful than his pictures. Therefore, instead of drawing a figure, he recalled his learning journey in chronological order through a timeline.

January-February: Overwhelmed

- cannot understand lecturers' accent;
- do not know how to write assignments;
- panic to submit the first assignment in February;

March: Fine on practicum; fulfilment

April-May: Many lectures and many assignments

- adapted to the programme;
- getting confident to complete this diploma;

June: Great on practicum

- great centre;
- great associate teacher, humorous and considerate;

Holiday

August-October: Impatient to graduate, doing assignments

November-December: Nervous on the last practicum

In Semester one, when he just arrived in New Zealand, a new environment for him, Ben was puzzled and nervous. He was *'panicking'* about submitting his first assignment. His experience of practicum was enjoyable. In Semester two, since he already knew his marks for the courses in the first semester were good, he had confidence in completing the programme. With higher expectations, he wanted to finish the programme with excellent grades. Ben complained that one of the courses was not helpful for him in the second semester. He found himself becoming

impatient in the last months as he could not wait to graduate (Based on the focus group interview). This could also be seen from the timeline. In Semester one, Ben recorded that his emotional feelings transformed month after month and he summarised the four months of Semester two study in one line. As Ben put it, he was *'impatient to graduate'*. He had adapted to the programme and had confidence in completing it with good performance. He did not record such extremes of emotions in the second semester. The last practicum was very important to Ben and he was nervous about his performance in the centre. At the last triadic meeting with his Associate Teachers, Ben claimed that he was too nervous to speak English fluently.

As Ben reviewed his learning journey, he expressed one of his classmates Erica's help and influence on him, not only on his study, but also on his daily life. Since he was new to New Zealand, Erica had given him plenty of advice on how to adjust to the city as well as to university study. Besides study, they often played badminton together. Ben stated that he was *'so lucky'* to make friends with Erica. Besides the influence of classmates, Ben also claimed the effect of the courses on him.

> *What we learnt is like, it feels like, if you read a novel, you definitely can't remember everything in it. But it does cause some psychological impact on you. This will affect many of your later behaviours. When we went to practicum, although all the things picked up from the class were forgotten, that would always reflect us on what we should do and what we should not do. And many people would also teach us those in the centre. Teachers in the centre will also set a good example and teach us a lot.* (B1-3)

> *I think Erica in our class was the most helpful to me last semester. Since I'm new in New Zealand, she is the one who is always there helping me to settle down. And whenever I encountered problems I would ask for her help. She was very helpful. For example, I was not familiar with Canvas at the beginning of the programme. She had helped me very patiently.* (B2-1)

Ben's learning journey is full of complexity. For example, Ben discussed his experiences and feelings from two different practicums. In the first practicum, he felt carefree and passed it with flying colours; teachers in that centre wanted him to apply for a job and stay. In the last practicum, he felt stressed and anxious since the regulations of the centre were strict. Ben thought highly of this last practicum and had raised his expectations to successfully pass this important practicum. This contributed to his stress and anxiety.

The process of learning to teach is unpredictable and complex. The multiple roles Ben plays also adds another layer of complexity. For example, Ben acted in different roles, as a student teacher enrolled in the teacher education programme, as a student teacher practising in the early childhood centre, and as an English tutor teaching Mandarin-speaking students English. Ben kept in contact with some of the students he had in China and used video calls with them to teach them English while he lived in New Zealand. Ben also taught some Mandarin-speaking students who lived in Auckland either face-to-face or online through WeChat.

Conclusion

In conclusion, from Ben's perspective, learning to teach has been mediated through multiple lenses. He has strong memories from China as a caregiver and teacher for his young nephews and from his role as a teacher in a language school. His understanding of what it is to become teacher are shaped by these memories. He has an underlying belief in the importance of connecting personally with his students. In the language school, this does not appear to have been particularly fulfilling. In the early childhood setting in New Zealand though, it appears that his approach to teaching and caring is well suited.

Ben has always maintained that he is a reluctant user of technology and that it was too difficult or not worth his effort to invest in new applications. It appears though that Ben is very confident to use technology to remain connected to his family and friends and to use it to keep tutoring students. What is more, Ben can see practical and appropriate uses of technology in early childhood centres to capture young children's learning stories for their parents.

Chapter 7. Connie's Journey

7.1. Who is Connie?

a. Background

Connie was born in 1979 and was 38-years old when she participated in this study. Unlike Amy and Ben who are unmarried, Connie is married and is a mother of a teenaged girl. Connie came to New Zealand alone in 2013 for her PhD study while her husband and daughter stayed in China. Connie used WeChat to make video calls to connect with her family. Shortly before she enrolled in this early childhood education diploma programme, she had completed her doctoral degree.

Connie was educated in China, from primary school through to an undergraduate bachelor's degree at a university. Connie did not tell me any details about her primary schooling or childhood. She attended a normal high school more than 20 years ago. Figure 7.1 was an image drawn by Connie illustrating how she remembered her high school classroom. It was an ordinary school and the classroom was simply furnished with desks in straight rows. What Connie remembered most clearly was that there was a pile of books at the front of every student's desk. There were two blackboards in the classroom, one at the front for lecturing and the other one at the back for current affairs. Besides these, a single drinking fountain stood in the corner of the classroom. As Connie recalled, there was no other equipment in her high school classroom. Connie majored in English at university and then had been an English teacher in higher education in South China for several years.

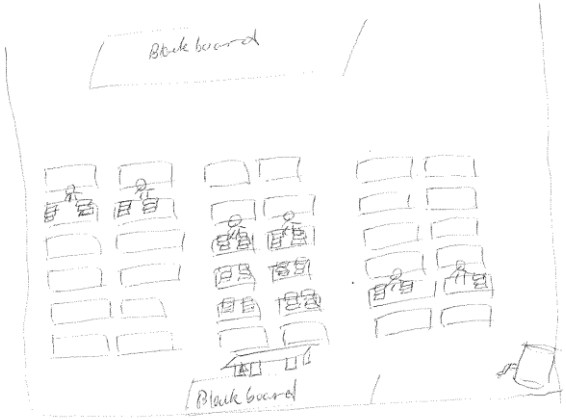

Figure 7.1. The appearance of the high school classroom 20 years ago – Drawn by Connie

Connie preferred to use what she referred to as *'traditional ways'* rather than new technologies. When she was in school in China, she used to write down notes with pencils and paper. Connie kept this handwritten note-taking habit for her doctoral studies, during which time she took notes with pen and paper rather than using a laptop. During her PhD study, Connie printed out the reading material rather than reading articles on a screen. Connie also recalled how she managed her references when she was writing her doctoral thesis. At the beginning of her PhD study, Connie had used the reference management tool RefWorks to manage her references. However, after storing around 20 articles in RefWorks, she stopped using it and began to use word documents to manage them manually. She saved the reading material in categorised files on her laptop. She also printed out her articles and put them into different folders. Instead of using the reference management software, Connie preferred to organise the articles manually. She explained that *'it works for me'*. Connie also mentioned another example which showed how averse to changing her ways she was. Instead of using the iOS system on her MacBook, she installed dual systems Windows and iOS because she was familiar with the Windows system. Connie considered traditional methods as effective and comfortable ways for her.

Connie explained that she had a slow response to new and emerging technologies.

> *Such as WeChat, I think I began to know it at a relatively late time. Obviously, some people have used it since 2011. I didn't use it until 2013.* (C2-5)

Besides being a late adopter of WeChat, Connie also mentioned her experience of rarely using Facebook as another example. In 2008, Connie went to America as a visiting scholar for four months. At that time, she created her Facebook account. However, she did not use it often since

she usually used text messages or email to make contact with others. After that, she had not logged on that Facebook account for a long time as the application did not work in China. As mentioned in Chapter 4, Erica, a Mandarin-speaking New Zealand citizen, had set an ECE group on Facebook. However, since Connie was not used to using Facebook, she had not joined the Facebook ECE group. When it came to OpenCourseWare or Khan Academy, Connie expressed that *'I don't think I ever thought about these. They are far advanced for me.'* (C1-5) Connie described herself as not accustomed to the new technologies.

More recently, as Connie claimed herself, she thought *'it was necessary to get to know more about technologies'* (C1-4). She thought it might be necessary to reactivate and get to know better the Facebook account that she had installed but deactivated many years ago. She realised that it would be necessary to reactivate her Facebook account in order to join the ECE Facebook group. When needed, she would make an effort to learn to apply the technologies. For example, Connie once learnt, and was acquainted with, some media, video editing and conversion software she needed, such as Format Factory. She used YouTube frequently for leisure, such as watching movies and TV series to relax and, when she was a doctoral student, to learn how to use different research tools. For example, Connie searched for useful clips on how to use the software package Statistical Package for the Social Sciences (SPSS). She also used YouTube as a student teacher to find resources to use in sessions with young children. Connie rated her overall skill in using educational technology as basic. Although Connie was reluctant to apply new technologies, she had made effort to use them out of necessity.

Connie assumed that a variety of factors could have an influence on student teachers' application of technologies. According to Connie, student teachers' usage of technologies might have a relationship with their age, nationality, and educational background. For example, not until she began this early childhood education programme, did she have an acquaintance with Google Drive. She had never used Outlook in China as it was not very popular among Chinese. In China, Connie explained, individuals could not get a direct connection with Facebook, YouTube, or Google. Other factors impacted on her usage of technologies. Connie recollected her experiences with her mobile phone during her PhD study to illustrate the influential factors.

> *During my doctoral study, I rarely used my mobile phone since I didn't know how to connect my cell phone with the campus Wi-Fi at the very beginning. I usually stayed on campus during my doctoral study. At that time, without connecting to the internet, I*

couldn't use WeChat via my phone. So I just forgot about the social media things at that time…Later, I discovered out how to connect my phone with the internet. I still rarely used it if the study schedule is particularly tight. For example, if I only have two or three days to write an assignment, then I would forget to check my phone. There may be a variety of factors that influence my behaviour. If I am particularly interested in and focus on one thing, I would not keep the phone in my mind. (C2-5)

This example above firstly showed access to the internet as an influential factor of using technology. Secondly, the study pressure impacted Connie's use of social media. Then, Connie's personal interest was another influence when she used technologies. This example also suggested that Connie might consider her phone or social media applications as a distraction from her study. Rather than multitask constantly, Connie described that she had to focus on one subject at a time. In this way, her phone had become a distractor. Her attention was divided between studying and checking her phone regularly for posts. In Connie's case, her acquaintance with technologies, access to technologies, study pressure, and personal interest were all influential factors on her application of technologies.

b. Motivation and aspiration

The educational environment in New Zealand was one of the reasons that drove her here. Prior to enrolling in this programme, Connie had completed her Doctoral Degree in philosophy at the same university. The reason why she applied for this programme was mainly that she wanted to change jobs from higher education and find a long-term job teaching in New Zealand. As to why she chose early childhood education rather than primary or secondary education, she gave a similar reason to Ben, which was a lack of subject knowledge. Even though she had studied English as her major in a Chinese university and taught English to Mandarin speakers, she thought that her level of English proficiency could hardly be compared to native speakers.

The educational environment in New Zealand was not only an attractive reason for Connie's own learning but also beneficial for Connie's daughter's education. Connie's daughter was studying in secondary school in China. Competition for college entrance examination in China is extremely fierce. In order to escape from that competitive examination environment, Connie had considered supporting her daughter to study in a high school in New Zealand. Therefore, to better support and give her daughter the opportunity to study in New Zealand was another reason for Connie to choose to stay here.

Before Connie enrolled in this early childhood education programme, she had researched it online to view previous student teachers' perspectives on the career and to know more about the programme. Through the internet, she found a popular blog written by a Chinese early childhood education student studying in New Zealand, recording and sharing her daily life and feelings.

> *I was thinking of someone's blog. But you didn't interview her. I don't know whether it's useful for you. It was a student teacher studying at NZTC. Her blog had a detailed record of her learning stories and daily life. Her blog is named 'Past and Present'. She is a Chinese student. You can search for 'Past and Present', 'New Zealand early childhood education'. You may search it through Baidu. There are some narratives of her personal life, but most of the contents are about her study and practicum. There is quite a lot of practicum in NZTC, not like us. I forget about how I get access to her blog. I just remember that I have searched online then I found her blog*. (C1-5)

Before Connie enrolled in the early childhood education programme, she searched for relevant information online. Even though the student who wrote *'Past and Present'* had enrolled in another college in New Zealand, her experience greatly helped Connie to find out more details about early childhood education and outline her future learning journey.

Connie had her application interview through Skype since she was in China at that time. As Connie explained, the focus of the interview is to check whether or not the applicant is suitable to be a teacher. She was asked about the reasons for her application to this programme and her understanding of early childhood education. Then she was asked about her visiting experience of early childhood centres, which she thought was a highlight of the interview. Skype provided a platform for candidates to be interviewed and accepted into the New Zealand programme from a distance.

c. My impressions

Connie was supportive of my research and focused her comments in our interviews on technology-related subjects. Since there was little technology that she could remember in her childhood she did not tell me details of her background or schooling.

Connie was born prior to the widespread use of technology. She experienced a traditional learning and teaching environment without access to digital technology and she was accustomed to that environment. Although she has her own iPad and Mac laptop now, she

preferred the traditional and familiar way of taking notes with pen and paper and managed her doctoral references manually. However, during the interviews, Connie reflected on her use of technologies and expressed that she might attempt to use more new technologies. Connie had basic technology skills and learnt to use essential technologies as needed. She considered herself a late adopter of technologies but she seemed to be moderately positive towards using and learning new technology.

Connie assumed that a variety of factors could impact on student teachers' use of technologies. During the first interview, when Connie answered my technology-related questions, she thought that students who were educated in New Zealand might have different answers from her own. From Connie's perspective, students' educational backgrounds could influence their use of technology. In Connie's case, technology did not appear to play an essential part in her daily life. She did not depend on it as much as the other participants to keep in contact with her family.

7.2. Connie's Learning Pathway

a. Campus-based – technology for learning

Connie had been in New Zealand for four years prior to starting the ECE course. Unlike the other two participants, she knows her way around the campus since she has just finished her doctoral study here. Over the duration of Connie's study, I had the opportunity to observe her in classes, interact with her via WeChat and email, interview her, and read her reflections. In this section, I have included Connie's typical daily schedule and two scenarios to give a sense of Connie's presence on campus. Then, I comment on these scenarios and discuss the impact of technology.

Daily routine example (Retrieved from focus group interview, page 13)

8.30a.m.-11.30a.m. Lecture

11.30a.m.-12.30p.m. Lunch

12.30p.m.-3.00p.m. Lecture

3.00p.m.-3.30p.m. Going home

4.00p.m.-5.00p.m. Reading

5.00p.m.-6.00p.m. Assignment

Scenario one

Connie stepped into the classroom with a bottle of hot water. She sat down in a back group with some other Chinese students. She put her notebook, a pencil, and an eraser on the desk. The lecture was delivered along with a PowerPoint on the screen. During the class, she listened to the lecturer quite carefully and wrote down two pages of notes in her notebook. While writing down notes, Connie also recorded her ideas and thoughts down as comments on her notebook's margins. (Based on field notes of an observation on 22 March, 2017.)

Scenario two

Before the class started, Connie had a conversation in Mandarin with another Chinese student on job searching. Connie mentioned that she kept in contact with teachers working in her last practicum early childhood centre on WeChat. They also talked about the study pressure in Semester two which they thought was less compared with Semester one. Then the class started. It was conducted on the Marae and focused on speaking te reo–the native language and reciting the pepeha.[19] All the students would state their own pepeha introducing themselves one by one, while the lecturer recorded it with a recorder and awarded a mark. Connie prepared her pepeha using online resources, such as the Māori Dictionary and the pronunciation guide uploaded by the lecturer on Canvas. (Based on field notes of an observation on 14 August, 2017.)

Connie preferred traditional and familiar ways to take notes in the sessions I observed. She had already formed her own study methods through her long learning journey which she did not feel necessary to change. She considered her methods as effective and convenient. However, technology use was evident in Connie's learning environment, such as the recorder and Canvas in Scenario two. I have included Connie's use of technology and her perspective of teacher educators' use of technology in the following section.

[19] In Māori, 'pepeha' is a way of introducing oneself. Using a set structure it identifies who you are, where you are from and where you belong. Pepeha is used in a Māori context and has a formal basis, but the idea is universal. A pepeha is a way to make links and connect with others. It builds a sense of identity and belonging.

i. Connie's developing perspective of technology

Through on-campus courses, Connie's perspective on technology has been affected by the lectures. When I asked about her understanding of 'technology' in 'learning to teach with technology', she mentioned the technology course to explain her thoughts.

> *I think it may be related to ICT. For example, a computer, an iPad, video, audio, and social media. But we have a technology course. In that class, the lecturer's definition is not this. In his definition, somebody may use some resource in order to achieve some purposes. The process of using some kind of resources to achieve the purpose or to solve a problem, or something like that, or a system, is called technology. Well, for example, this ballpoint pen is a product of technology. But now when we speak about technology, it may refer to a narrow category. For example, steamships, aircraft or something like that. That is the past technology. Another example, the teacher gave an example that, there was a child who wanted to open the door. But the door was always closed automatically. The child took a thing to hold it. Then the thing could also be seen as a technology element. Because the child thought of using resources and using a tool to solve a problem*. (C1-4)

Connie's explanation of technology here is not intended to garble the concept of digital technology and industrial technology. The course she is referring to actually teaches about the design process of making things to solve a problem. In this case, if you want to make a keyring, you design what the keyring is for and then solve that problem. Technology is a process. Connie is implying the possible affordance of both digital technology and industrial technology in early childhood education. When she used technology in relation to this study she was referring to digital technology. However, the lectures she had had broadened her thoughts on the possibilities and varieties of technology that were used in initial teacher education.

Connie reflected on the technology course where they had made badges and key chains. As a Chinese student teacher, she thought that industrial technologies played different roles in New Zealand and China.

> *In particular, as a Chinese student, I feel that these tools are not reachable in China. I think these are not related to me. If I need a badge or a key chain, then I will go to buy it. But we rarely buy these tools. Comparing to westerners, they usually have some basic set of tools for every family. They may think highly of cultivating their own hands-on ability. That's my point of view.* (C1-6)

Connie's understanding of technology as a design process is limited to thinking that it is about making gadgets, something that would not happen in China. She thinks that this example of making keyrings is typical in New Zealand households but it is no more likely than in China.

Connie considered digital technologies used in teaching as convenient, and engaging. However, there were still specific problems related to how technology was used in the course.

> *When the course is over, the notes and PPTs that the teacher puts on the Canvas could automatically become a folder and then can be saved by us. But we couldn't do that now. I also sent an e-mail to the programme leader to ask about this issue. She said it seemed that the resources would be removed after the course ended. By then we couldn't access the resources. So I thought that I would download these items one by one before the end of the course.* (C1-4)

Connie thought that the learning materials uploaded onto Canvas were useful and wanted to store them for future reference in her teaching. She thought that technology should and could afford students a more convenient and efficient way to do this than downloading them one at a time.

The wide access to technology could also be a distraction in some circumstances. When Connie had just started her PhD study at the university she had not known how to get access to the Wi-Fi connection on her phone. As a consequence she did not use her phone, nor feel the need to use it, at the beginning of her studies. However, once she learnt how to connect to Wi-Fi, she told me that she could not just leave her phone in her bag. She had to keep connecting and checking her phone from time to time. Technology, then is acting as both an enabler with easy access and a distracting constraint in student teachers' learning.

ii. Connie's use of technology for connecting with others

Because of her previous experience of studying at this university, Connie had given plenty of advice to others through the WeChat group, such as how to find useful information through Canvas and how to reference with APA style. Except for sharing this useful information, Connie did not often chat or gossip in the WeChat group. Unlike Ben, she did not often share her moments in WeChat either. Even though Connie did not chat in the WeChat group, she would often check the chat history to keep up to date and share information to help students in need.

Technology provided a platform for Connie to connect with others even though she is not the one who initiates the chat. For example, Connie participated in the graduation ceremony in September for her Doctoral Degree. Coincidently, Ben also went to the ceremony to celebrate his friend's graduation. At the graduation, Ben took pictures and videos for Connie and shared some in the WeChat group. As a result, Connie received congratulations from other student teachers. She also shared her feelings in the group, expressing that *'the moment is quite exciting'*. Connie also commented that she hoped that they could participate in the next year's graduation ceremony together for the completion of the diploma programme.

iii. Connie's perspective of teacher educators' use of technology

Connie considers that how a teacher educator uses technology to explain content is important. She does not think it should be used just for the sake of it if it is not effective. Different lecturers, with different teaching styles, used technology in different ways. Connie said that teacher educators should consider students' perspectives when using technology. She mentioned a lecturer who uploaded a video on Canvas to comment on students' assignments. While some lecturers just made simple oral comments on the students' general performance, that lecturer made not only general comments but also specific comments on each individual. Connie thought highly of that lecturer's commitment. Connie explained that she thought lecturers should be aware of their audience's reaction to their use of technology. Depending on their level of audience awareness a lecturer might upload reader/user-friendly files so the students would receive the lecturers' comments expressed in a thoughtful way and consider themselves to be respected. Connie attached a lecturer's message with several paragraphs to illustrate a reader-friendly message.

> *I hope this finds you all well. I have enjoyed reading your Participation Task discussions over the past three weeks and watching you develop and refine your philosophy statements and reflections. Please ensure that...Also ensure that you have addressed all of the assessment criteria and use the CW-AssessmentTask 1A & B Discussion for any questions you may have. There are supporting resources available under Course Assessment Resources - Assessment Task 1A & 1B Resources.*
>
> *Assignments 1A & B are due to be submitted as ONE document to the Turnitin dropbox by **12.30pm Friday August 25th**. Please submit as ONE document including both parts. There is also a draft Turnitin dropbox for Assignment 1A & B so that you can submit your assignment for Turnitin feedback prior to your due date…Please note that **you must***

> ***submit to the official assignment drop box by the due date*** *(or your approved extension date) or late penalties will be incurred.*
>
> *Finally, the topic for this week, Marketisation of care and education, is now open for you. As always, any questions or concerns about anything - please do ask.* (Retrieved from Connie's email on 8 October, 2017.)

The message contained detailed information but the tone was warm and positive. Words in bold were important information, while words with underlining were hyperlinks relating to relative information. It is easy for the students to read and follow the instructions and to explore the hyperlinked supporting resources.

Compared with Semester one, Connie thought that the lecturers' use of technologies in Semester two was *'quite similar'* with only slight differences. Most lecturers continued to use the computer and the projector throughout the programme. In Semester two, some lecturers had started to build a connection with student teachers' on social media and used it to assist their teaching.

> *In this term, some of our teachers start to use Facebook. I'm not in that Facebook group. But I can tell that from the class because sometimes the teacher may mention it. Sometimes, the teacher may ask our student representative to post her notifications from Canvas to Facebook to make sure that we will see them.* (C2-3)

Teacher educators used social media as an additional way to make sure that all of the students received notifications. Lecturers used the Facebook group, which the students were familiar with and always used, to notify them in a student-friendly way.

Another example of how lecturers used technology was evident when Connie mentioned one assignment that had to be done online. The assignment was to upload a couple of pictures and organise many hyperlinks. Connie was not an expert with the programme and the uploading speed of pictures was very slow. Since it was a requirement, it meant that Connie had to spend more time on formatting the assignment than focusing on writing the assignment content. When Connie reflected on this assignment, she thought that it could have been handed in on paper, which could have saved her time on technological affairs. She thought students should have the option of choosing whether or not to use technology and what technology to apply during their learning instead of merely obeying the authority of teachers.

iv. My impressions of Connie's use of technology for her learning

Connie knows her way around campus and Canvas, since she had four years as a doctoral student before this ECE programme. Though not a digital native, Connie has basic skills in using technology. She uses it as and when needed to support her learning and other students in need. While she is not one to initiate a chat in the WeChat group, she keeps up to date and connected through this platform.

Connie thought that teacher educators' use of technology was critical in students' learning. Teacher educators' application of technology should be consistent with the teaching content in a student-friendly way.

b. Practicum based – technology for teaching

Connie kept reflections during practicum as was required by the course coordinator. She also shared them with me via email. I interviewed Connie about her practicum visit and recorded notes in my journal. In this section, I have included Connie's daily schedule and two different practicum reflections to give a sense of Connie's experience on practicum. I draw on her reflections and interviews together to describe Connie's learning journey as a teacher on practicum with technology.

Daily routine example (Retrieved from focus group interview, page 14)

7.30a.m. Reading a book

8.00a.m. Greeting family; setting up outside

9.00a.m. Setting up an art experience

10.00a.m. Work inside; support children with the art experience; morning tea with children

11.00a.m. Continue with the artwork with children

12.00p.m. Lunch

12.00p.m. Help with tidy up

1.00p.m. Play with children outside; help with tidy up

2.00p.m. Read a book at mat time

2.30p.m. Go home

9.00p.m.-11.00p.m. Reflection

Connie's notes of her use of technology in the centre:

Play with children at the kindy computer.

Help and support children with the use of the computer.

Reflection one

This morning when Zac (who is a Chinese boy over two years old) played at the water trough I talked with him about the creatures in the water. I, being a Chinese, deliberately spoke in English with Zac because Lily (a teacher) told me that Zac's mum expects teachers to help Zac develop his English communication skill. Zac enjoyed the play and named the creatures in English. Suddenly he began to hit the water making a soft splash. He was evidently excited at the splash and made a few more splashes. They were soft splashes; I thought it was okay and cheered along with Zac moderately. At this moment another student teacher came over and told Zac not to make splashes. Zac would not listen, so the student teacher asked him to leave the water trough. Then the student teacher told me Lily (a teacher) said we need to redirect the children and develop their awareness of rules. (R:C-1-1)

The primary and secondary schooling I attended in China contained many rules and adopted behaviourism heavily. The kindergartens my daughter enrolled in also had many rules. I thought many of the rules my daughter and I experienced did not respect the individuality and children's needs and interests. Therefore I have developed a somewhat tolerant attitude towards children's behaviours. I tend not to 'rule' them if their deeds do not cause potential harm or discomfort to others and themselves. The student teacher's words raised my awareness of the importance of rules. After all children also live in society and in future they will have more interactions with wider social environments. They need to be aware of rules and learn to follow them so that they can build a harmonious relationship with their environment and make valued contributions to society as the aspirations in Te Whāriki describe. (R:C-1-2)

My AT suggested I can explain to Zac the idea of free play within boundaries. I understand that rules are not fixed, and that they depend on the context. So I can tell Zac it is okay to make splashes in a puddle when he wears gum boots or play a sprinkler, and it is also fine if he makes small splashes at the water trough. (R:C-1-2)

In Reflection one, Connie had progressive reflections on the relationship of rules and children's individuality. Since Connie and her daughter both *'adopted behaviourism heavily'* during their

schooling, Connie wished the children she taught could be respected more on their needs and interests. Based on her apprenticeship of observation, Connie developed a *'tolerant attitude towards children's behaviours'*. Through the practicum, she realised *'the idea of free play within boundaries'* and reflected more on her understanding of the management of children's behaviours.

Reflection two

> *The other day two children Kate, Sally and I moved from the play dough area to the art table because they wanted to check an art book for reference. I found another two children Nick and David already sitting at the table painting. I talked with Kate and Sally about the art design in the book they were interested in. I stopped to observe their work on sea shells and noticed Nick's art work was wonderful. I said, 'Nick, your work is really cool.' He said nothing, and I did not give further feedback or questions. Kate and Sally showed interest in Nick and David's painting on shells and also wanted some shells. I asked David if he could show them where shells were, and he did. Later I noticed that Nick left the table and showed his completed work to Vani in excitement*. (R:C-3-1)

> *While talking with Kate and Sally at the table, suddenly I came to realise that I did not talk to Nick or David at all about what they were doing. 'Have I neglected them? What would they feel about my engagement with other children but non-engagement with them at the same table?' These questions crossed my mind. Therefore I stopped to observe what Nick and David were doing and commented on their work. Maybe because I did not display deep interest or maybe because I had not developed a reciprocal relationship with Nick, Nick did not respond to my comment. When he went away to show his work to Vani, I felt his joy of completion and his longing for sharing and celebration with others. At that moment I was certain that our relationship had not been developed. Nick did not show his work to me at all when he finished and went straight away to Vani.* (R:C-3-2)

Along with Connie's reflection, there were associate teacher's comments as well. In the extraction of Connie's Reflection two, when Connie mentioned that she praised one of the children as *'Nick, your work is really cool.'*, the associate teacher commented as:

> *This comment may be one factor that influenced the ongoing interaction (or lack of) with Nick. You may remember that we had some discussion in class around praise and encouragement and growth mindsets. I would suggest that you revisit some of this*

information. The following is a link to some useful tips about responding to children's creative endeavours http://eduart4kids.com/kids-artwork-4-ways-comment/

Connie replied to this comment as *'very specific and helpful tips'*. Connie had learnt and discussed the praise and encouragement of children in class, on campus. When she was on practicum facing the situation of praising children, she still had the problem of enactment. Here, the associate teacher connected what the student did in her practicum with what she learnt in the class to provide detailed feedback. Moreover, the associate teacher also provided specific suggestions on praise and encouragement by linking a website.

The schedule and reflections above are some entries to get a sense of Connie's practicum experience. The problem of the 'apprenticeship of observation' and the 'problem of enactment' will be further discussed in the next section along with the 'problem of complexity'. In this section, I have described Connie's use of technology during her practicum.

i. Connie's use of technology to connect in early childhood centres

Technologies afford Connie communicative ways to connect with associate teachers and supervisor teachers. She could get her assignment feedback from the associate teacher through Canvas. In Scenario two, Connie mentioned that she still kept in contact with the early childhood teacher from her last practicum through WeChat.

In addition, as Connie took photographs for the children's learning stories, sharing with parents could also be a connection afforded by technology among teachers, parents, and children. Connie introduced an application as an example to highlight the technologies used in recording children's learning stories.

> *There are many technologies used in early childhood centres nowadays. They generally use some software which may be developed by some companies. There is lots of software that mainly works on dealing with documents. There's an app named Storypark. There are a lot of kindergartens using this. It's not free. It seems that all of the children's information could be put into the computer or an iPad, including children's accident record and their medical history. In addition to Storypark, there are some other applications. I can't remember the names, while you can search it online with the keywords as 'app for playing centre' or 'for kindergarten' or 'for early childhood centre'. We just generally know the basics of these. When we work as a certificated teacher, then we will probably know more about a particular app.* (C2-6)

Connie named Storypark as an example of various applications used in early childhood centres. Though she just knew the basics of this application, Connie could search online for more information on technologies used in centres.

ii. Connie's perspective of influential factors of using technologies in centres

Early childhood centres' access to technologies and regulations directly influence student teachers' use of technologies on practicum. At the end of the year, after three different placements, Connie commented on the differences between them.

> *In my personal experience, the centres which I went to for practicum all have their own public iPads since they do not allow us to take pictures of children with our own cell phones or cameras. Some centres are in good conditions then there may be more iPads, maybe allocating every teacher with one device. Or maybe the iPads' screens are in a larger size. Some centres in poor conditions may have iPads in a smaller size. Teachers in these centres may have to share a public device. Therefore, the centres commonly don't allow the teachers using their own cell phones during work. During my practicum, I was not allowed to take pictures of the children using my own cell phone…The specific rules may be slightly different in each centre.* (C2-6)

According to the three centres' regulations, Connie was not allowed to use her own digital devices to take photographs for children. The specific rules vary in different centres. The quality and quantity of public digital devices in different centres were also different. Without permitting using personal digital devices, the access to the centre's public technologies impacted on student teachers' use directly.

Parents' requirements were another influential factor on teachers' use of technology mentioned by Connie.

> *Some parents had clearly said do not take photos of their children when enrolling them. It could be the reason for religion or privacy.* (C2-6)

Connie had to respect and pay attention to parents' specific requirements when she took photographs for children to record their learning journeys.

iii. My impressions of Connie's use of technology for her teaching

Connie talked about how teachers use technology to connect with others, to take photographs for children, and to record children's learning journeys. Student teachers' use of technology in centres was influenced by the centres' specific regulations and the parents' requirements. It appears from the reflections and conversations Connie shared with me that she had not used technology a great deal in the centres except for taking photographs. She focused on relating to the children face to face. She was also keen for them to have real experiences rather than watching a screen.

c. In retrospect – three fundamental problems in Connie's becoming journey

In the previous section, I mentioned the problem of 'apprenticeship of observation' and the 'problem of enactment' stemming from Connie's reflections. I have drawn on Connie's reflections, interviews, and my observations of her to discuss the three fundamental problems in Connie's becoming journey mediated with technology.

i. The problem of the 'apprenticeship of observation'

In Connie's case, her study experience in New Zealand's educational environment drove her to pursue a long-term job in the early childhood education area here. Connie achieved her doctoral degree in New Zealand through which she made her decision to live in this country. Since New Zealand was short of early childhood teachers, Connie made a seemingly practical choice to study this career path. Her prior study experience influenced her to settle in this new environment, and her job as a teacher in higher education influenced her desire to continue working in the education field.

Connie's perspective on using technologies in education was pragmatic. She had basic educational technology skills but only used what she found was necessary. When she was on practicum in centres, Connie rarely used technologies with children. She would use technologies when needed, such as for writing children's learning journeys with StoryPark application or connecting with children's parents with emails. Connie's background impacted on her use of technology and influenced her teaching philosophy. She was educated under strict discipline and, as a consequence of wanting something different, she developed a tolerant attitude towards children's behaviours. This attitude was further reflected in her practicum to focus on the balance of freedom and boundaries. Furthermore, her background may have influenced her towards spending time playing alongside children rather than using technology.

ii. The problem of enactment

In Connie's reflection, where she mentioned that she praised one of the children as *'Nick, your work is really cool.'*, the associate teacher added a comment suggesting that she should revisit some information on how to respond to children's creative endeavours. Before the practicum, the student teachers had discussions in class on praise and encouragement, and growth mindsets. However, when dealing with the real situation, it is not as easy to do what was taught. There is a gap between Connie's ability to translate what she has learnt in multiple settings and how she reacts in the teaching moment.

This is also, in part, due to the fact that there are usually other children and adults that may be distracting. Furthermore, there may be safety issues, regulations, procedures and management concerns that come in to the situation making enactment difficult.

iii. The problem of complexity

Connie recalled her one-year learning journey as a circle of readings and lectures, that is, a few weeks' study on campus, followed by a few weeks' practicum in a centre, and then readings and lectures. Lectures and practicum were weaved into a circle. Besides these, Connie also found a part-time job as an occasional reliever in an early childhood centre. Through this journey, Connie concluded herself growing as a teacher and mother.

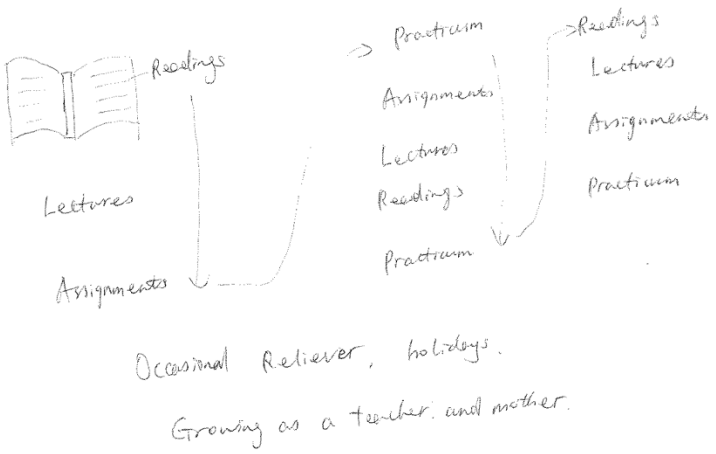

Figure 7.2. The process of the one-year learning journey – Drawn by Connie

As the programme progressed, Connie's attitude towards study had slightly changed.

> *In Semester one, I studied quite hard. But in Semester two, I didn't study as hard as in Semester one. Because I worked part-time as a reliever in Semester two, which might account for some studying time. Since in Semester one, I did nothing but study. On the one hand, the first semester was fresh for me. And it was said that some of the courses were difficult to pass. So I had worked very hard. I took it very seriously. During the second semester, on the one hand, since I had already known how the study looked like, I might be a bit lax. On the other hand, I might feel a little tired in the middle of my study journey. Moreover, I took the reliever work in the second semester. So during my working days, there was no way to do readings. Without reading, then I would have no idea what the lecturers' instructing. So the results were definitely different.* (C2-5)

At the end of the year, when Connie reviewed her one-year learning journey, considering the factors that affected her process of becoming teacher, she placed the educational environment as the most influential factor.

> *I put the educational environment in the first place. And I also consider it one of the reasons that attracted me to come and study here. I think that everything we did is in the whole educational environment. The national policy and the syllabuses are definitely part of this educational environment. So I think this is the most important factor.*

The New Zealand educational environment, as Connie recalled, was one of the motivations for her to study here. She had thought that the educational environment would be better for her daughter than in China. In her opinion, both the national policy and the syllabuses were elements of the educational environment and it was the most important influential factor.

Looking back on the one-year learning journey, the practicum experience and the course study were the main and essential aspects of the programme study. Connie thought they were the second most influential factors.

> *The experience of practicum also has an impressive influence on me. It helps me to get to know the specific practice of early childhood education in New Zealand. It helps me to know how the teaching is carried out here. And I get to know better about the resources, the environment, the children and the teachers here. The course study is also very important. We used to know little about this before. Even though we have studied in education before, we mainly focus on tertiary students. Then we learn systematically about*

early childhood education here, including the framework, the requirements for teachers, the knowledge of early childhood education, and the teaching skills.

Connie placed personal experience and the lecturers after these influential factors.

The following influential factor is the personal experience. I think this individual experience may influence one's educational philosophy, teaching methods, and even attitude towards life. Therefore, education philosophy is closely followed. Although all these courses are conducted in the same general environment, the concepts of each person are different. Then each person's teaching practice will be different.

The lecturers are also very important. They not only deliver knowledge to us but also act as moral models for us, showing us the power of the spirit. Associate teachers play a similar role.

Cross-cultural life and learning, I think, is beneficial to us, such as how to interact with parents and children of other cultural backgrounds at work.

Similar to Amy, Connie also took her English-as-second language as a double-faced sword.

Then followed by my own family background. It forms part of my character and that it affects my educational philosophy. English as a foreign language, I think, on the one hand, it may be a disadvantage. From a certain aspect, I may have difficulties in communicating with colleagues and children. But on the other hand, it could be an advantage that my mother tongue is Chinese. I could better communicate with the parents and family members whose mother tongue is Chinese.

Besides, you can learn from each other with your classmates. We could support and help each other when facing difficulties in the learning process. And it is important for us to build a network for our future professional development.

I feel that the diploma certificate is the last important influence. You'll get it when you complete your programme. But it is essential for a fixed job and further professional development in the future. (Retrieved from focus group interview, page 3)

Conclusion

Connie prefers to use traditional learning tools and less technology in her study and in her teaching practice. For example, she is comfortable using more traditional ways of taking notes with pencil and notebook. However, she would also learn to use technology when it was needed. For example, she learns and applies video editing software. Connie is disciplined in using technology while she admits that technology can be a distraction in her life. She also said that she wanted to focus on the content rather than presenting her assignment on-line, which is also another example of technology being a distraction from the real task of learning content. She teaches in the early childhood centre in a relaxed way, without much use of technology.

In conclusion, Connie's becoming journey has been influenced by multiple factors. She considers the educational environment as an important influential factor in her journey. Her own educational experience, along with her daughter's experience in adopting behaviourism, impacted on her understanding of learning and teaching. She develops as a teacher who respects children's individuality and is tolerant of their behaviour. New Zealand's educational environment is the main attraction for Connie to learn to teach here.

Chapter 8. Learning to Teach with Technology

In the previous three chapters, I have presented aspects of Amy's, Ben's and Connie's learning journeys through their one-year programme of study to become early childhood teachers. I focused on the implicit and explicit presence of technology in teacher education. In an era of rapidly developing digital technologies, teacher education programmes in different sectors are explicitly preparing future teachers to integrate technology into their practices and take advantage of the affordances that digital technologies provide. Modelling effective practice is particularly relevant in primary and secondary sectors but at early childhood, its importance is less evident. At the same time, implicitly, student teachers are entangled with technology. They use it regularly to interact with the institution's learning management system and to interact with one another throughout their learning journeys. When they are on practicum, they use technology to record children's learning journeys and see that the teachers in early childhood centres use technology in different ways. Given this, I was particularly interested in the way that technology enabled or constrained Mandarin-speaking students in the early childhood teacher education setting–both on campus and while they were on practicum.

In this chapter, I interweave my personal perspective of the Mandarin-speaking students as a group of learners through the three fundamental problems that the participants experienced as they studied in the New Zealand context. Then, I explore the affordances of technology in their learning journeys both on campus and on practicum. Finally, as a bricoleur, I reflect upon my research journey according to the three fundamental problems, recalling my own learning ups and downs, exploring how I use technology to enable my research, and discussing what I have learnt from this complex process.

8.1. Chinese Students in the New Zealand Context

For a Chinese student teacher to become a New Zealand qualified teacher, it is a complex process. By observing and learning alongside my participants, I have become sensitive to the way Chinese students adapt to their new environment. It is a journey that involves negotiating many different situations, often more difficult by their different cultural background and

language proficiency. I will unpack some of this complexity through what I have previously referred to as fundamental problems.

a. Becoming an apprentice New Zealander

One of the key differences for Chinese students is that they are often confronted by a 'cultural clash' since they bring a different educational history and cultural biography to their studies. China is described as having a 'large culture' approach (Holliday, 1999) to education. According to this approach, Chinese students are cultivated by a homogeneous national culture which substantially determines their personal behaviours. This national culture, collectivist in nature, emphasises connectedness, group goals, and harmony among in-group members by supporting each other. In contrast, individualist cultures highlight personal goals and boundaries between self and other (Hofstede, 1983).

This then provides a useful way to broadly frame the cultural clash experienced by the participants because the Chinese students' motivation to achieve can be said to be based on collectivist values. For the Chinese, the family constantly and substantially impacts on them. The family members include members of the immediate family (for example spouses, parents, grandparents, brothers, sisters, sons, and daughters) and members of the extended family (including aunts, uncles, cousins, nephews, nieces, and siblings-in-law). The Chinese students tend to achieve success to meet their families' expectations as well as to realise their own dreams. By contrast, Western societies' achievement motivations tend to be individually oriented.

In this research, all three participants' motivations for enrolling in this programme are related to their family's influence. Amy and Ben are inspired by their interactions with their own nieces and nephews to study early childhood teacher education. Connie wants her daughter to study in New Zealand so she chooses to be an early childhood teacher to make a life in New Zealand. Family is, therefore, an important constraint and enabler in a person's growth, development, and learning.

The collectivist values instilled in Chinese students influence their interaction and connection with others. They emphasise connectedness and group harmony. When they study abroad, away from their families, they tend to connect with other Chinese students because they shared similar values and language. As I saw, the participants in this research joined the ECE WeChat group and Facebook group because it facilitated social interaction, friendship, sharing and

mutual support. Group members obtain support from, and contribute to, the group as well as maintaining a sense of cooperation and harmony within the group.

Watkins and Biggs (1996) focus on the Confucian-heritage culture as the homogeneous national culture and explain this large culture's influence on the 'Chinese learner'. Confucianism is a system of thought and behaviour originating in ancient China which emphasises academic achievement, the belief in effort, and the importance of education for personal improvement (Lee, 1996; Li, 2003). It is possible to see this influencing the participants in this study. Underlying their effort and diligence towards study is this imperative to achieve high grades and to improve themselves and the reputation of their family.

The collectivist and Confucian heritage influence the Chinese students' conceptions about learning as well as teaching. Traditional ideas prevail. Students are expected to be obedient, disciplined, and to complete all assigned tasks without question. For the participants in this study, their prior experience of schooling as students has provided an 'apprenticeship of observation' and shapes the core beliefs, assumptions, and learning receptivity. They focus on the discipline of the classroom to keep a harmonious learning group. They emphasise the children's academic achievements as well as their moral development in order to cultivate their contribution to society. With regard to teachers' professional development, they are encouraged to work together and to improve teaching through lesson studies rather than working individually.

To summarise, a useful way to understand the affects of the cultural clash experienced by Chinese students is that they are enculturated in a collectivist and Confucian-heritage culture that emphasises connectedness, group goals and harmony, and academic achievement through effort and diligence in learning. When this is experienced on a daily level throughout their own schooling, it creates an apprenticeship of observation that influences their conceptions and beliefs of learning and teaching. This creates an educational experience that is different from that experienced by their New Zealand-educated counterparts and shapes how they see their role as students of teaching and as teachers in New Zealand. The differences between Chinese and New Zealand students' contexts could be likened to comparing walking in an evergreen Kauri forest after having always experienced walking in a deciduous coniferous forest if I was to use the analogy of learning to teach being like a hiking journey. Although at a basic level in the two walks are similar, experience in the coniferous forest provides a different conceptual and ecological knowledge for making sense of the deciduous forest.

b. How to enact Chinese values in a new culture

The preceding discussion suggested that a 'large culture' approach was a useful way of framing Chinese students homogeneity. However, besides the 'large culture' factor, it is crucial and necessary to focus on the 'small culture' (Clark & Gieve, 2006) explanations for the individual behaviours and beliefs of Chinese students. The influence of 'large culture' on individuals is moderated when the individual is immersed in a different or specific context.

As an example, Chinese students experience the differences in teaching pedagogy between China and New Zealand. Teaching in the Chinese classroom is both 'teacher-centred' and 'student-centred' (Watkins & Biggs, 2001). Although teaching in China seems to be 'teacher-centred' with a teacher 'transmitting' content in front of the students, Chinese teachers consider the students as the centre of the learning process, orchestrate students' involvement during classes (Cortazzi & Jin, 2001), and aim to realise students' meaningful understanding and deep learning. It might be more appropriate to refer to teaching in China as 'teacher-led' and 'student-centred'. By contrast, teaching in New Zealand is 'student-centred' which encourages students to initiate inquiry and cooperation. When Chinese learners transfer from China to New Zealand they need to adapt their learning approach from focusing on listening and absorbing to collaborating and expressing. The learning and teaching process in China and New Zealand both aim to ensure students' meaningful understanding and deep learning but that happens in different ways through diverse activities.

Chinese students' teaching beliefs, constructed under Chinese culture, influence how they operate in the New Zealand educational environment. Chinese students are taught to be well-behaved and obedient during their schooling. This impacts on their teaching belief that they should manage the children as well as teach them content. However, the student teachers experience and observe through their learning and practicum in New Zealand that children are encouraged to explore new and uncertain contexts. The Chinese student teachers' teaching beliefs about protecting and managing children conflict with the new beliefs about encouraging children to explore new contexts. This collision of teaching beliefs requires the student teachers to understand the context and policy of the new setting and conduct themselves 'properly'. They need to find a balance between protecting the children from danger and guiding the children to explore in uncertain settings.

Chinese students' learning journeys are mediated by the two different cultures. It can be said that they are experiencing the problem of enactment since they need to overcome the gap

between what they used to do in China and what they need to do in New Zealand. With different cultural backgrounds, student teachers have different beliefs and philosophies toward learning and teaching. What the student teachers have experienced is not the same as that in Western countries. What they have experienced has cultivated who they are. What they learnt and observed in New Zealand challenges their prior teaching beliefs and philosophies. For the participants in this study, learning to teach involved an ongoing negotiation between two different cultures. If I compare this to the hikers on the trail, the experience is initially understood and experienced from their prior experience of hiking, but then expanded as they encounter new and different things along the way. Their expectations may be that the trail will be a scenic, meandering path. What tools or clothing the hikers have are different and perhaps not as naturally suited to the environment, but they can adapt that clothing or those tools to meet the new environment. They may struggle with unexpected barriers. Navigating the route successfully requires compromise and modification, much of which is hidden at the outset of their journey.

c. Becoming New Zealand teachers – always complex

In the process of learning to teach, Chinese students are influenced by the teachers and students they make contact with, by specific courses that they take, the programme, and the broader education system. They interact with, and are connected to, other people, places, and contextual factors. They are Chinese students becoming New Zealand teachers. On multiple levels, this is a complex problem.

One level of the complexity is learning in a second language. Language proficiency is a basic criterion for Chinese students to study abroad. The participants in this study are three Mandarin-speaking student teachers, two of whom majored in English in tertiary education while the third had taken language courses to pass the English language test before applying for this diploma programme.

Although having Mandarin as their mother tongue could be considered a constraint since they were studying an English-based programme, as dual-language speakers, it also enabled them in certain circumstances. As in any multi-cultural country, children in early childhood centres have various cultural backgrounds. In the early childhood programme, there was a particular course–Languages and Cultures–where student teachers had developed knowledge, skills, and attitudes associated with the planning, teaching, and assessing of languages and literacies. They acquired basic knowledge about dominant and minority languages in New Zealand and learnt

about children's developmental linguistic stages. As bilinguals, they had a better understanding of the issues for children's language acquisition, especially children with a similar Asian background. Speaking Mandarin also enabled them to communicate with Mandarin-speaking parents in early childhood centres. Being able to speak to the child and parents in Mandarin not only had a positive impact on the children becoming confident, competent communicators in Aotearoa but also impacted positively on the participants in this study.

Language, and the ability to articulate ideas clearly, is related to one's confidence and self-identity. For Ben, language was not only a communication tool but a representation of his identity which contained his prior experience and was a mirror of who he was. When he transitioned to high school, he felt the need to change his dialect to try to negate the fact that he came from a village. As he grew up, he became more confident and did not need to change his dialect deliberately to imitate and please others.

'Fitting in' as Mandarin-speaking students studying in English in New Zealand is important if students are to integrate into New Zealand's learning and teaching environment. However, Mandarin, as their mother tongue, will always set them apart from native speakers. Speaking Mandarin with one another and in professional settings, as is sometimes required, helps build their self-confidence.

Learning to teach is an emotional process, which adds another layer of complexity. Students often begin their learning journeys with excitement, anticipation and motivation. However, the learning process is often different from what students expected and they experience a rollercoaster of emotions. The participants in this study experience challenges adjusting to the language and academic expectations, as well as new social contexts. They face challenges settling into a new city, away from their families, and dealing with personal issues such as where to live and with whom. Chinese students, as with other international students, experience mental health issues, such as depression and anxiety (Chen & Bennett, 2012; Ellis-Bosold & Thornton-Orr, 2013). They experience the cultural difference and must adjust their prior educational philosophy according to the new context. Such challenges and experiences invoke an emotional aspect to their learning journeys. These unexpected and interrelated factors influence their learning journeys. As with any learning journey, preparedness and emotions add to the richness and complexity.

In summary, this section discussed the three fundamental problems of teacher education in respect to being Chinese students learning in the New Zealand context. In respect to the

problem of the apprenticeship of observation, their Chinese educational background shapes a set of beliefs oriented around valuing connectedness, group goals and harmony, academic achievement, effort, and diligence in learning. When they chose to study in New Zealand, they interacted with a new culture, environment and contextual factors that both challenged and clashed with these prior beliefs. In respect to the problem of enactment, this they needed to reconstruct an identity which achieved a balance between two different cultures while also becoming teacher. Finally, in respect to the problem of complexity, this was often experienced in recursive and multi-layered ways as the participants navigated the journey of learning to teach.

8.2. Technology Affordances in Learning to Teach

The complex journey of learning to teach as a Mandarin-speaking student teacher was introduced above in relation to the three fundamental problems. In this section, these three problems are further discussed with respect to the way technology works as an enabling constraint in the process of learning to teach.

a. Technology as a constant in participants' lives

Technology and education have always been closely entwined and coevolving. As Del Campo et al. (2012) outlines, the history of technology within university education has progressed from chalkboards in old traditional classes; through to projectors in the eighties and presentation software in the nineties; to the video, electronic board, and network resources today. However, such development does not sit outside of the influence of other important developments, such as the decreasing costs of technology and connectivity, the broadening access to wireless internet, and the increasing speed of a device's central processing units (CPUs). A good example of this is the mobile phone, which has not only become cheaper, but also more powerful and connected through faster wireless and phone networks. This improved affordability is reflected in the results of the questionnaire that showed that all of the student teachers had their own cell phones and 92.6% of them had two or more devices including phones, laptops and tablets.

As can be seen from my participants' experiences, student teachers' use of technology is part of the process of effectively adapting to, and navigating, the context they are situated within. When the participants recalled their school time 20 years ago, there was no technology in the

classroom. By contrast, nowadays, their classrooms contained computers and projectors. This changed context also resulted in changed educational practices. While they used pen and paper to take notes 20 years ago, now they used their own laptops, tablets, and phones to not just record information, but also give them access to information beyond the classroom. In this changed context, technology is ubiquitous. The university campus is covered by Wi-Fi and, as students, they are connected to free and unlimited Wi-Fi. While this allows them to surf online freely, it also invokes an implicit expectation of, and need for, technological proficiency. Competently adapting to the technology was critical to successfully negotiating the context, anytime, anywhere. Students log-on to the canvas learning management system through computers or phones, checking announcements and reading lists at any time.

With the evolving technologies used in teacher education, there has been a commensurate adaptation in the use of technology to support learning. As observed in this study, my Mandarin-speaking participants used technology to build and keep social networks as a core aspect of the learning journey. It has long been accepted that learning is a socio-cultural process (Vygotsky, 1980) and technologies have the potential to facilitate the communicative and social process (Dunlap & Lowenthal, 2009). As discussed above, Chinese culture emphasises connectedness and group harmony. Chinese students feel comfortable when they are connected within a social network, especially when they are abroad, in a New Zealand context. It is common and convenient for students to build a social network with technologies. With the accessibility and connectivity that technology affords, student teachers are acquainted with social media and are proficient with its use. Social media is reported as one of the main sources of leisure among the younger generations (Tess, 2013). It is an extension of their normal everyday activity to communicate with others through technologies. Therefore, not unexpectedly, student teachers in this early childhood teacher education programme had built their social network on Facebook and WeChat spontaneously.

The findings of this study show that students prefer to use familiar applications to build social networks. In addition to the Facebook group, the Mandarin-speaking students in the teacher education programme also built another group through WeChat. As observed, this was one of the first things the students did in their programme, with 16 Mandarin-speaking students joining the virtual WeChat group on the Induction Day. None of them had met or knew each other before then so it was something that was seen as highly desirable and necessary from the beginning

While the concept of study groups is not new, technology affords an easy and fast way for students to support one another through a social network. All of the Mandarin-speaking students already had their WeChat accounts. It was familiar and easy for them to build a group through WeChat. Besides WeChat, other social media are also used in students' social activities, such as Facebook. In order to participate in the Facebook group, Ben registered his first Facebook account. Connie even considered reopening her Facebook account to join in the Facebook group after several years of neglecting the application. Even though Facebook is less popular than WeChat among Chinese, it is widely used in Western countries. In order to keep a connection with a broader community of students in this programme, the study participants also joined the Facebook group to connect with all of their classmates. One insight that this study provides then, is that Chinese student teachers prefer to use familiar technologies while they also accept new technologies to build a social network and connect with others.

A social network can morph into a beneficial learning community. The three participants all mentioned the influences of the WeChat group and Facebook group on their learning. From when I was included in this WeChat group, I witnessed its growth. Its nature was fluid and emergent. It initially provided a means for the participants to build friendships and share elements of their common culture. For example, the Chinese New Year came soon after the Induction day, and the social network enabled the newly formed group to strengthen their relationships by sending celebratory wishes to each other. In this way, the student teachers got to know each other, shared their feelings and personal lives with each other, and had journeyed through all the ups and downs together. They initiated get-together activities through the WeChat group to have lunch or sing karaoke on a night out. After the activities, photographs and videos of their gatherings were shared through the online group. This sharing of photographs, videos, and memories reflected the way the group members built a closer relationship with one another. At the same time, the social network afforded more than just friendship, since it was also a means for the students to share programme information and learning resources as well as support each other through the learning journey. As observed, they expressed their feelings of stress with each other and discussed their assignments.

The Facebook group operated as a learning community in a different way. It was utilised to keep connected to all the students in the programme cohort and also to share learning resources during the course of the programme. In Semester two, some lecturers published announcements and reminded students of important notices in the Facebook network. The social networks started as platforms for students to be connected with each other but they also functioned, in

the academic aspect, for students to share learning resources and discuss academic issues. It was beneficial to construct an online learning community with technology.

Technology enabled the participants to construct and build an affinity within the online learning community. Based on their similarities and common language, the students were able to share their challenges with each other and discuss the cultural shock in the process of this programme. It was a permanent community that extended beyond the course. For example, Ben went to a classmate's wedding after their graduation. Others continued to share personal experiences, photographs, and comments. Building a learning community with such affinity was beneficial for students, professionally and emotionally.

Their online learning community has the potential to support these student teachers' lifelong becoming journeys. Technology affords a permanent connection between students. For example, even after their graduation, some of the students were still active in the online group and met each other offline. Some of the students shared professional learning opportunities in the learning community and decided to participate in further education programmes together. The support among these students enables this learning community to continue, and the shared experiences enable it to flourish.

Technology enabled a fast, safe, and useful way to share information through the learning community. Students shared helpful resources, notices, and a variety of other information in different forms, such as words, sounds, images, and videos.

The learning community complemented the required online learning management system. For example, a lecturer asked a student representative to put an announcement, which she had uploaded to Canvas, onto Facebook. Since the Facebook group included all of the student teachers, the teacher educators also participated in it and considered this Facebook group as an additional way to manage learning and teaching. It works effectively for the students as a learning enabler and as a supplementary addition to the required, official online learning management system. The WeChat group was an exclusive group with only Mandarin-speaking students. It was not used by the lecturers. The Facebook messages were not duplicated onto the WeChat group, but the WeChat group members would sometimes remind each other to check or discuss important Facebook messages. The Facebook platform was considered as an additional learning management tool to push out information and notices. The participants in this study managed the need to use Facebook as well as WeChat in order to connect with other students. The efficiency of information dissemination is related to the feature of the media.

Similar to Messenger, Facebook and WeChat supported information dissemination to the phone, straight away. When information was posted on Canvas, it was sent by email. Students tended to be slow to read their emails, whereas WeChat and Facebook provided an efficient and faster way for information dissemination.

The self-organised, exclusive learning community, afforded students the opportunity to communicate openly and candidly. Mandarin-speaking students could interact, without being judged by non-Mandarin-speakers, in this space. The WeChat group operated underneath the other forums and was invisible to the teacher educators. Within such an exclusive group, the cultural shock could be shared, and some particular problems could be discussed. For example, on one occasion, a student representative, who was also a Mandarin-speaking student, proposed that they ask the faculty to translate the assignments into a Chinese version. This proposal caused a heated discussion in the group since other students objected to it. They argued that the student representative could express it as a personal request, but they could not represent all the students on such a proposal. Ben commented that as an international student, it was his obligation to master English as the learning language. Amy also expressed her opinion that they were representatives of China and should overcome this language obstacle to improve their reputation rather than asking for special privileges. After the discussion in the WeChat group, other students declined the student representative's proposal. This issue was specific to the Mandarin speakers and could be discussed openly in this exclusive group. Because of the lecturers' absence in the WeChat group, students could discuss such issues freely and critically. Compared with the official university-applied Canvas learning management system, the WeChat group is a self-organised platform. Students could communicate their up-and-down feelings with each other, share their daily lives, and even commented on lecturers' teaching contents and pedagogical approaches. It enabled students to express personal feelings and opinions openly and candidly.

I observed that as technology evolves, so too does the participants' use of it. They adapt and try new technology to overcome problems and to connect with others. Because their needs and contexts are always changing throughout their learning journey, their use of technology fluctuates. They learn from their peers and by observing their lecturers to understand what works. Building a community of learners, for social and professional reasons, appears to be the most important affordance but this takes time and a common purpose.

b. Technology as an enabler and constraint

The data shows that technology was important to student teachers' learning and teaching in several ways. In the following section, I consider how the technology enabled and constrained students' professional development on campus and during practicum.

Firstly, technology afforded the opportunity to make learning more interesting, convenient, and efficient. For example, lecturers incorporated pictures, audio, and video into their teaching. In this way, the content being taught was presented in ways that both added interest to the information and made it more accessible. Another example was the convenience of having the learning material in a digital form. Rather than carrying umpteen reading materials, the students could just bring a digital device with everything on it. Another example is provided by the way the student teachers could search for learning resources online with technology. Technology afforded an easy and fast way to search for information. In these cases, technology augmented traditional approaches to enhance learning.

Secondly, technology transformed the learning environment. The most obvious example was in the way technology extended the opportunities for students to collaborate both face-to-face and online. The participants in this study were observed contributing to group work through Google Docs on many occasions, sometimes in the classroom, and at other times, from different locations. The way they used Google Doc transformed the learning space from being just a physical location as well as extending it to accommodate asynchronous learning.

Thirdly, technology enhanced many aspects related to assessment. For example, the student teachers had to submit their assignments through the Canvas LMS. Because it was in a digital form, the system could easily check for plagiarism. Another example was in the way Google Docs could record students' individual contributions. In this way, the Google document not only displayed the final work done by the team but also had a record of the process leading to that final product. Through Google Docs, the teacher educator distinguished students' individual contributions to the teamwork which enabled the lecturer to assess the team's work collaboratively and individually. Another example was the way technology enhanced both formative and summative assessment. Self-evaluation and reflection were promoted as an important skill to develop. As observed, technology enabled the student teachers to easily keep an e-portfolio which was used to evaluate themselves. Technology enabled different assessments realised in various forms.

While it was evident that technology was deeply entwined with the students learning and transformed many of the practices they experienced, it was also evident that it impacted on their teaching while on practicum. For example, the student teachers used their centre's public devices to take photographs of children to capture their milestones. In this sense, the way they used technology substituted and augmented their ability to capture and record children's learning stories and milestones in a more vivid approach and share them with the children's parents to enhance the close relationship between children and parents, children and teachers, as well as teachers and parents. Technology also worked as a tool to enable student teachers to manage children's behaviour. For example, a short video clip could attract the children's attention to sit quietly. Technology also enabled student teachers to discipline children in a positive way by acting as a reward or incentive for good behaviour.

Such experiences on practicum helped to more readily uncover the problem of enactment. While the issues and potential of technology were discussed in the university lecture context, it was on practicum that these were lived in a real sense. For example, when student teachers study on campus, they do not have the pressure to manage the children's behaviour. When they are on practicum, the student teachers have to worry about how to apply what they learnt from the lecturers in practice. At the same time, student teachers need to manage children's behaviour and direct their energy. Using technology as an incentive and reward for good behaviour was not covered in the university course, but it was a key aspect of the pedagogy in the practicum context.

Though technology works as an effective way to manage children, student teachers were concerned about whether it is beneficial for children. Technology constrains children's face-to-face connection with others. Rather than watching a screen, student teachers believed that children should learn through interaction with teachers and social connection with their peers. Participants claim that technology should not be a substitute for a warm teacher. Other factors such as parents' restrictions on their children's screen time also influence student teachers' use of technology during practicum.

Technology is also a constraint when it becomes a distraction for student teachers. Maintaining connections online requires considerable time. Accessing technology to interact socially–to scan friends' photographs and posts, and to comment on them can become habitual and a distraction. In this way, technology becomes a constraint, impacting on their learning time. Many students become overly reliant and dependent on their personal devices to look for

resources and information. This too, can be very time-consuming. Because there are so many different applications and platforms, students can opt to use those with which they are more familiar. They can adopt new technologies more slowly because they do not want to invest in learning new tools. In this sense, the range of technology is restricted to what students know already. Their reluctance to try new technologies can constrain them to learn online in narrow ways.

One way of considering the degree to which the student teachers' professional learning activities were transformed by technology is to draw on Puentedura's (2013) SAMR model. He suggests that the first two levels of this model, substitution and augmentation activities, can be classified as enhancing learning while the next levels, modification and redefinition activities, can be classified as transforming learning. In this study, some practices represented all four levels of the model. For example, often, the use of PowerPoint to present information represented substitution, while it could also be an augmentation if the presentation device afforded the opportunity to include other forms of information such as images and videos. The data in this study showed that technology usually substituted or augmented more traditional teaching styles, although there were examples of how it modified and redefined learning, for example, access to online learning, asynchronous collaboration, and evidence-based assessment with Google Docs. With the integration of technology, learning could be modified and redefined.

To summarise, technology enabled an engaging, convenient, and effective way to learn to teach. Not only as substitution or augmentation but in its ability to transform the learning environment into a collaborate space that affords ways to assess students from different points of view. In the early childhood centre, student teachers applied technology affordances to manage children and capture children's learning stories. However, the feeling was that technology should not substitute for the warm teacher. Children were encouraged to interact with their teachers and connect with their peers.

c. Learning to teach – always complex

A key premise in this thesis is that learning to teach is an incredibly complex process, requiring teachers to deal with the multifaceted nature of teaching. As Glouberman and Zimmerman (2002) state, it is a form of complexity that can be contrasted with the simplicity of following a recipe or compared to the complicatedness of sending a rocket to the moon. As outlined in chapter two, the complexity of educational phenomena is a result of many interdependent

components interacting in nonlinear ways. These networks of relations give rise to novel properties that arise which are unstable, unpredictable, and always in the process of emerging. Learning to teach is a complex activity enacted in a VUCA (volatile, uncertain, complex, and ambiguous) educational environment (Davis & Sumara, 2006). What is effective in one context offers no promise of working in another context, or even a second time in the same context. Learning to teach while in the position of teacher is dynamic and unpredictable, with many interpretive possibilities. Student teachers can become frustrated when they face the gap between educational theory learnt on campus and situational problems that arise on practicum (Bore & Wright, 2009). The problem of complexity for student teachers is far from being a stable and complicated context; every class is full of uncertainty and possibility. Furthermore, teachers have to consider multiple problems simultaneously in a complex practice, including achieving multiple teaching goals, building relationship with diverse groups of students, and mastering comprehensive kinds of technology, pedagogy, and content knowledge (TPACK). Teacher education not only prepares student teachers for practicum as it should be (i.e. future-focused) but also enables them for practising as it is currently, with all the pragmatic constraints (Darling-Hammond, 2006).

In thinking about the problem of complexity in this way, it is possible to map a network of relations that constitute the landscape of teacher education that the student teachers in this study had to negotiate (see Figure 8.1). The components of this network can be seen as both enabling and constraining the process of learning to teach. In the following section, the constraints and enablers are discussed in detail. Constraints and enablers are illustrated and simplified separately below while they are closely connected factors which simultaneously influence the learning journeys with the use of technologies.

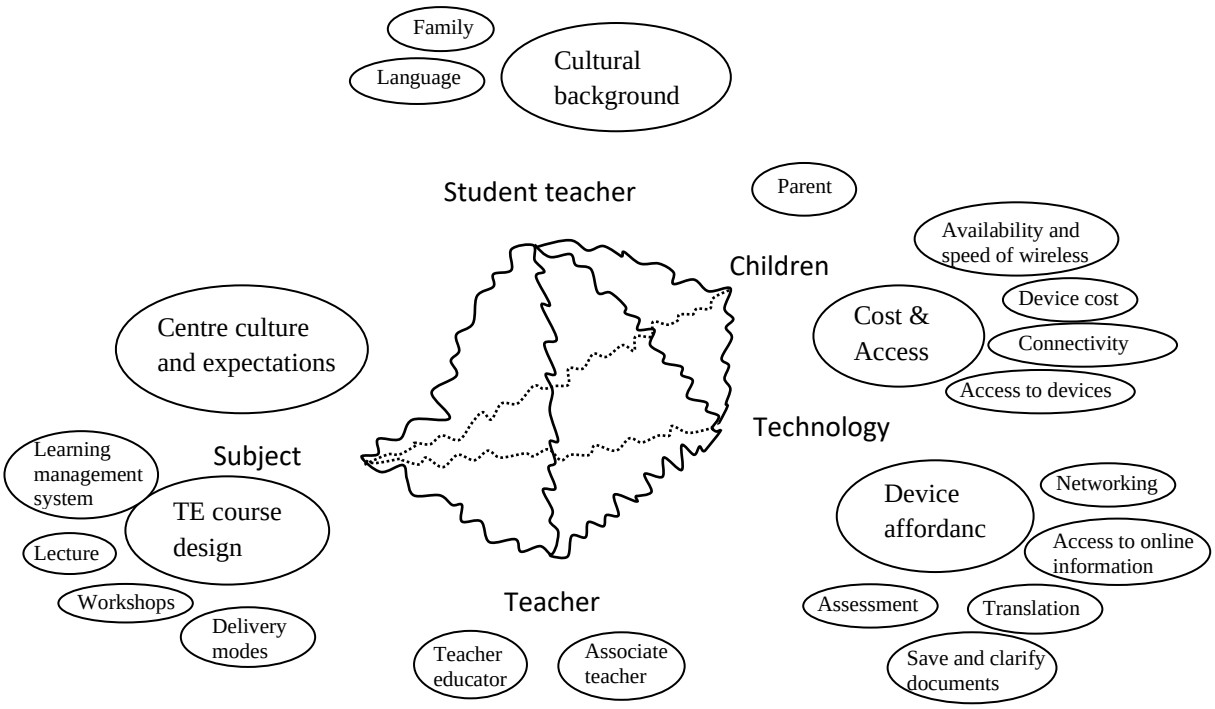

Figure 8.1. Constraints and enablers in student teachers' learning journeys

i. Technology

It was evident in the student teachers' personal journeys that various technological factors were co-implicated in each person's digital learning journey. For example, factors such as device power, device cost, connectivity cost, access to devices, and wireless and wired availability and speed, were all implicated in shaping engagement with digital technologies. For example, all three of my participants have an iPhone, which was affordable for them. Most students are willing to pay up to $1000 for a phone, but have limited data plans on their phones. Having Wi-Fi connectivity across the campus allowed easy access while on campus. Such factors co-evolved with each other: new technologies enable new and more powerful devices that can take advantage of broader and faster connectivity at an affordable price, which means it can be used more broadly in educational contexts. In this way, such factors become enablers of technology use in education.

While the cost and access to technologies enable the student teachers' learning journeys, it also constrains their journeys in certain circumstances, such as technology being a distraction. For example, my participants mentioned that they would avoid using their phones when they focused on study since checking the phone from time to time could be a distraction for them. Social networking online also constrains the students' face-to-face connections. My

participants considered technology as useful to connect with each other, while at the same time they thought highly of the importance of connecting with others face-to-face. Besides, the addictive use of technology could impact health. For example, my participants worried that watching screens for a long time may impact on the eyesight of themselves and children as well. Other factors, such as consideration of privacy, censorship, and politics, all impacted on technology use. For example, on 7th August, 2020, US President Donald Trump banned US residents from doing any business using WeChat from 15th September. It might seem that the participants were not influenced by this comment, while they might be indirectly influenced by it. For example, they could be worried about that New Zealand might also commence similar regulations. Technology application is influenced by various factors, directly and indirectly.

When they were on practicum, different centres had different conditions and requirements for student teachers' use of technology. For example, my participants mentioned that different centres were equipped with different quantities and qualities of digital devices. Some centres would provide student teachers with public tablets to take pictures of children for recording their learning stories, while some centres would offer a public camera. Parents also had requirements for using technology out of health and privacy considerations. Some parents required limited screen time for their children in the centre. Some parents asked not to take pictures of their children. Various factors influenced student teachers' use of technology when they studied on campus and on practicum but technologies were acting as enabler constraints in student teachers' learning journeys.

ii. Teacher

Another key factor in shaping students' engagement with technology was the teacher educators' pedagogy. The students' journeys reveal that two factors, in particular, were critical enablers for the students. Firstly, having the teacher educators model how technology can be used in teaching was important. Student teachers imitate their teacher educators and pick up their attitudes towards technology. When a teacher educator is confident with technology and sharing digital resources in the class, the student teachers tend to also search for and use more related digital resources. Lecturers' active participation on the Canvas also influences student teachers' use of that platform. Secondly, having an LMS as a core organising feature of the course normalised its use. Through lecturers' use of Canvas in class, students acquired more familiarity with this learning management system. By comparing different lecturers' usage of technologies, the participants had their opinions on the efficiency of technology use. They

would comment on whether the lecturers' usage of technology was effectively achieving the teaching goals or it was just an add-on that had no connection with the teaching content.

Teacher educator's use of technology is intertwined with students' use. For example, Canvas as a core organising feature of the course, is regularly used by both the teacher educators and student teachers. Lecturers sometimes ask students to put up notices on Facebook. For example, if a lecture is cancelled or if a reminder needs to be sent informally, but it is not used as a duplicate. As for the exclusive WeChat group, student teachers could easily organise it by themselves. It could be an autonomous learning space for the students. Regular information is organised through Canvas. Emergent or essential information could be duplicated on Facebook to attract students' attention to it. Specific information, such as information about international students, could be shared through the WeChat group. Teacher educators could share the information to all the students by themselves, share the important messages with a student representative who passed it on to other students, or ask a student to transmit specific information through their exclusive learning community. Teacher educators should be aware of the target students for sharing information and disseminate it through appropriate channels.

However, teachers' use of technology could also be a constraint to students' learning. It was frequently observed that some teacher educators were not proficient with technology and this detracted from the student teachers' learning. For example, in one observation (11 May, 2017), the lecturer attempted to play a video clip during class. It was obvious that she was unfamiliar with the technology and was confused about how to get the video to play. As a result, the momentum of the lesson was lost at that point. Though the lecturer's use of technology was not important as a role model for early childhood students, what was important was that teacher educators modelled confidence and competence when using technology. Their attitude towards technology rubbed off on the students. Besides acting as a technology modeller to influence student teachers, lecturers' requirements of using specific technologies could also be a regulatory constraint. It is necessary for students to have the option to choose whether or not to use technology and what technology to apply during their learning instead of merely obeying the authority of teachers.

iii. Subject

Student teachers' use of technologies varied across different courses. One of the reasons related to different teachers' varied usage was that individual teachers had different technology skills and attitudes. Other reasons concern the course contents and the assessment requirements. For

instance, the Art class might make use of CD players more, while the Exploration course might apply more technologies to do hand works such as making a keyring or a badge.

In this diploma programme, the main assessment method is scoring the student teachers' assignments. Since this programme was a one-year intensive course, all three participants mentioned the pressure of doing their assignments. Student teachers' emotions, such as passion, curiosity, or tiredness, might influence their attitudes on assignments. Besides that, the assignment requirements might impact on students differently. There are assignments through which students could think, learn, and explore. They might find the assignments helpful for their learning to teach and then cared less about the grade they received. While some assignments were as pointless for students as just doing homework to achieve high scores. Therefore, the assignment could be an enabler as it assisted students' learning or it could be a constraint if it was meaningless for the student.

In this programme, student teachers study in a university-supported digital learning environment. The university promotes the use of computer-assisted learning management systems. On Induction Day, the contacts from the IT-support team were introduced to the student teachers. During the programme, technology-related workshops, such as workshops on how to make e-portfolio, were provided by the university to the student teachers. The university not only provides public devices, such as public computers, but also offers support for student teachers to better use them. The digital learning environment affords student teachers opportunities and support to learn with technology.

iv. Student teacher

The participants in this study are three Mandarin-speaking student teachers who have been educated in China from primary school to tertiary education. Obviously, language is a basic criterion for them to study abroad. Technology enables students to pick up new English words and translate them in a more convenient way. Students could also use technology to record the lecture and replay it again for a deeper understanding. In these circumstances, student teachers are, to a certain extent, dependent on the technologies to overcome language difficulties.

Although Mandarin as a mother tongue could be a constraint, as they studied in English, as a dual-language speaker, it also enabled them to better communicate with Mandarin-speaking children and their parents. More than just a communication tool, language is related to one's

confidence and self-identity that you have in common with other native Mandarin speakers so it helps in one respect, while on the other hand it stands you apart.

With different cultural backgrounds, student teachers might have different beliefs and philosophies toward learning and teaching. Family is an important constraint and enabler in children's growth, development, and learning. As the saying goes, parents are the first teachers of their children. The familial expectations, the circumstances, the hardships, advantages, and support systems, are all cultural factors that influence student teachers' becoming. What the student teachers have experienced might not be the same as that in western countries. As they studied abroad, they began to apply new applications. My participants also claimed that student teachers' usage of educational technologies might be influenced by their age, educational background, and national background. What they had experienced, cultivated who they are.

Even though student teachers lived with ubiquitous technologies, their perceptions of the application of technologies were complicated, multifaceted, and elusive. Growing up with developing and ubiquitous digital technologies, students today are considered as 'digital natives' (Prensky, 2001), 'Net generation' (Oblinger & Oblinger, 2005; Tapscott, 1998), and 'Generation M(edia)/(ultitasker)' (Rideout et al., 2005). Student teachers' nowadays, are taking familiar technologies for granted, both in their social life and in their academic study. When the students are accustomed to a specific technology device, this habit might constrain the learners from using other technologies since it takes effort and risk to attempt new technologies. When it comes to unfamiliar technologies, student teachers' perceptions of the perceived usefulness and ease of use could influence their application of the technologies. Previous research has demonstrated that technologies may be more likely to be applied when perceived to be useful (Montero Perez et al., 2014; Sadaf et al., 2016; Zacharis, 2012). It might take more time and effort to become acquainted with unaccustomed technologies though. When technology is considered as easy to use, it could also improve students' usage of it (Liaw & Huang, 2003; Luan & Teo, 2009).

Student teachers' perceptions influence their usage of technologies. Mutually, their usage of technologies reciprocally impacts on their perceptions. Obviously, as the student teachers make more attempts to use technologies, they would become more familiar with them which would be helpful for them to attempt more technologies. Therefore, a beneficent cycle could be built and maintained.

In summary, student teachers' learning journeys with technology are full of uncertainty and possibility. These influencing factors, as constraints and enablers, are navigating the students through the learning to teach process. Although these constraints and enablers were stated separately, they work together at the same time, forming the complexity of learning to teach.

8.3. Reflections as a Bricoleur

This section is about my reflections on this research journey with the Mandarin-speaking students using technology. I reflect, as a bricoleur, on the three fundamental problems to express what I have felt and learnt through this research journey.

a. Becoming an apprentice bricoleur in New Zealand

In the introduction chapter, I outlined my own educational background of learning with technology to locate myself within the research assemblage. As a bricoleur, I am motivated and influenced by my own relational milieu. I cannot separate myself from my history to become an 'objective' researcher. From the outset of this research, it was important to commit to a process of reflecting on and interrogating my own position in this research.

This has been my first time studying abroad. I still remember the first day I flew to New Zealand. When I transferred in the airport, I felt that I was surrounded by foreigners. Then I suddenly realised that, actually, I was the foreigner to the others. Therefore, this research is not only about Chinese students' becoming journeys - from student to teacher in a foreign context but also a story of young people from a different background, me included, learning to become others in this New Zealand setting.

When I settled down in New Zealand and began my study journey, I gradually came to know more and more Mandarin-speaking doctoral students in my faculty and was invited to join in an exclusive WeChat group. There were around 140 Mandarin-speaking students from our faculty in that group. The group members included enrolled students, graduate students, and prospective students. Master students, doctoral students, and invited scholars were all included. Group members could share their daily experience with others and support each other. My prior experiences had already primed me to know how WeChat afforded social connection. On the Induction Day of this early childhood teacher education programme, I witnessed the formation of a WeChat group with 12 Mandarin-speaking student teachers. I also experienced the

evolution of this group into a virtual learning community. WeChat afforded the building of an autonomous, self-organised, and efficient learning community which enabled student teachers' professional development. I considered how important it had been in my own learning journey. I had joined various WeChat groups and considered it primarily as a platform for social connection. However, through my research, I came to appreciate the technology's educational affordances and the importance of self-organised learning community to my own learning journey. What I used to take for granted, from a personal connection perspective, has had an important influence on my professional journey.

I mention the importance of WeChat in my research to illustrate the value of efficient and effective use of social media in educational settings. Similar to Facebook and other social media, WeChat affords a platform for students to share resources, ideas, and comments, virtually, as well as to invite one another to face-to-face interactions. While this is usually taken for granted in daily life, from a personal perspective, it has the potential, in educational settings, to transform into a learning community. Students connecting at a personal level on these platforms can become more motivated to attend lectures, to commit to collaborations and engage in on-campus activities. Since the WeChat group is commonly exclusive to Mandarin-speaking students, the shared information here is typically filtered to be of relevance to the group members.

In a more general, inclusive group such as the Facebook one, much information covering all of the group members' different needs is shared. An exclusive group, such as WeChat, enables a degree of filtering messages so that they are more pertinent. Personally, I paid less attention to the inclusive group messages since they were often of little relevance with me. By contrast, I would pay more attention to the exclusive group messages since I considered them as related to me. For example, a writing retreat recruitment was announced via a newsletter through email and via the Facebook page. I did not notice this information until a doctoral student shared it and actively drew my attention to it in the WeChat group. This information had been submerged in an ocean of material along with messages about Yoga classes and food trucks on campus. WeChat, with the added affordance of the highlighting capability, effectively filtered important information.

As a Chinese student, I joined this WeChat group and identified with it. I feel secure being a group member. Rather than being an individual, I want to keep harmony and identify with my peers. I have the same collectivist values as my Chinese participants–I want to please my family

and my teachers. I pay attention to impression management when meeting with my supervisors. I attempt to make the impression that I am diligent and doing well. Growing up in a culture to respect teachers, I consider that my supervisors have the authority of spreading knowledge. Therefore, instead of questioning, I pay more attention to listen and absorb information, while my supervisors have encouraged me to be independent and make my own inquires.

This bricolage accommodates the relationship between me–a bricoleur–and the objects of this research. My perceptions and assumptions underpin the outcome of this research. For example, in chapter 6, I reported that Ben preferred to read from paper rather than from a screen. He told me that in the context of having had an enjoyable experience of reading books in a book store, and I have drawn the connection that student teachers' journeys are mediated by their prior knowledge. I have not extrapolated that to infer that all student teachers are reluctant to use technology or to suggest that they all prefer to use it wherever possible. What I have attempted to explore is that student teachers' attitudes towards and perception of the usefulness of technology fluctuates in different contexts and under different circumstances. This process of becoming is complex. Rather than highlighting a static, fixed point I have used my bricoleur's perspective to paint a fluid picture of ambiguity.

b. Enacting my research bricolage

As a Mandarin-speaking doctoral student, I share a similar cultural background and learning experiences with my participants, which is fundamental to building our close relationships. Based on this relationship, the participants felt comfortable and secure enough to share their learning stories with me. I think that a non-Mandarin speaking researcher would not have understood a lot of the difficulties and conversations we had. I do not think that the participants would have shared so freely with someone else because of our shared cultural background. I really appreciate my participants' support for my study and research. This was an added burden for them but I think that they contributed because they trusted me to tell a story from their/our combined perspective. They saw value for me and for other Chinese students.

However, there were always issues to overcome, for example, scheduling meeting times that were appropriate for them and myself; being aware of the stresses in their lives, for example, when they had assignments due and they were not in the mood to be interviewed. One student initially agreed to participate, then withdrew, due to the pressure of the academic workload, regretted the decision and re-joined, only to finally withdraw. This was an example of what I wanted to accomplish but could not be actualised because my participants were so busy. As a

bricoleur, I realised that my interactions with my participants are mercurial, unpredictable, and complex. Not only was I mindful of my participants' time and mood but I was also affected by my own moods, energy levels, and stressors.

Language difficulty added to my problem of enactment during the data generation process. I interviewed my participants in Mandarin and then translated the transcripts into English. I used Google Translate for the full transcription in the first step. Then, I manually double-checked and retranslated sections I considered most important. Google Translate is fast and relatively accurate but it is necessary to interpret some of the literal translations. For example, when one participant expressed that technology is 'cold' without interpersonal interaction, Google Translate translated it as 'technology with no temperature'. I reviewed the interviews according to my understanding of the participants' meaning. This is one layer of language difficulty for me.

Another layer is that I need to express myself accurately in academic English. Once, I wanted to use the word 'undesigned' to describe a toy. I firstly described a computer game with many designs. Then, I wanted to refer to another kind of game with fewer designs. In terms of word-formation, I added -ed to form the adjective of 'design' and then added -un to form the antonym. This is how I might form a particular word learnt from my schooling. However, 'undesigned' is not an accurate English word. Another example is my use of the word 'fancy'. I translated a participant's description of the digital devices in the classroom as 'fancy'. What I understood of the participant's meaning was that the devices were technologically advanced. When my supervisors reminded me that the word 'fancy' had an implication referring to fashionable but not practical or functional in that context, I realised that 'advanced' could be more accurate than 'fancy' in that expression. I appreciate my supervisors' help during this research process. They found the ambiguous expressions and helped me to clarify my words. Without their reading and comments, it is hard for me to realise my mistaken expressions since I consider them as correct according to my logic.

Studying and researching abroad in a second language is hard for me. It is hard to think in English. What I was used to doing is translating English into Chinese and thinking in Chinese then, translating what I thought into English. To overcome the barrier of language, I have attempted to participate in the language enrichment workshops, to talk to Aucklanders and local students, to read the newspaper in English, as well as to watch TV in English. However, I still maintained my Chinese. The whole language barrier has been a constant impediment for me. I

have used the social network here to keep myself sane and connected to other Chinese students. I do not have to invest cognitive load into communicating in Chinese. I was used to thinking in Chinese all the time. In one of the earliest meetings with my supervisors, my supervisor asked me to write what I had been grappling with in Mandarin and then to translate my written characters into English. It seemed to her that I was articulate in my own language but struggled in English. My supervisors have suggested to immerse myself into an English environment and I think it is crucial for me. However, I reflect that I have not made as many New Zealand friends here as other Chinese students. Although I think it is right for me to immerse myself into English, I just could not stop thinking in Chinese and find it more comfortable and easier to communicate with Chinese. While my supervisors want me to be more critical and analytical during my study process, I have been conditioned to follow teachers' instruction rather than questioning. The gap between what I was suggested, what I thought was right, and what I actually did is the problem of enactment.

The process of analysing data is an iterative, emergent, and complex journey. As a bricoleur, I assembled diverse texts, such as interviews, observation notes, and literature, to create a bricolage with rigour, depth and complexity. The process is a fluid, emergent construction for me as a bricoleur. I moved back and forth between English and Mandarin, between being a researcher of others and a researcher of my own journey, always responding to the unpredictable and uncertain environment.

c. Researching as a bricoleur – always complex

In the first two sections, I recognise that my interactions with the objects of my inquiry and participants are layered, mercurial, unpredictable, and complex. To a bricoleur, the process of interpretation is to explore relationships. Rather than 'a correct relationship' or 'regime of truth', there are always multiple relationships and new relationships continuing to emerge.

During this research process, complex challenges emerged. As a beginner bricoleur, I sometimes felt confused since I did not have linear steps to follow. It was a struggle for me to find a structure to frame my writing or for the reader to follow my work. Rather than being guided by the framed procedure, I stepped out of my comfort zone, embarking on an uncertain journey, to explore a layer of complexity via my lens. Complexities also emerged in the process of data generation. It was challenging to manage the complex amount of data. I had to walk back and forwards and avoid being overwhelmed by the complex information. It was important to keep connected with the research problem while writing the findings.

Technology has enabled me to connect with and record my participants' journeys, formally and informally. It has also enabled me to overcome the obstacle of learning in a foreign language. Chinese students use technology to interpret and translate the language to cope in an environment where their native language is not dominant. They do this quietly and unobtrusively. As a native Mandarin speaker myself, I also experience similar struggles to the students. I know the difficulty and embarrassment of contributing to a face-to-face conversation when I am struggling for words. Since I do not have the nuanced understanding to be able to say what I want to express, I feel so frustrated, embarrassed, and incapable. I have come a long way to overcome this language difficulty but I am still struggling. Language is a challenge every day for Mandarin-speaking students as well as other international students. Technology enables us, international students, to live and study in a foreign language. However, technology such as Google Translate is helpful but far from enough.

Technology has also facilitated my connection with other Mandarin speakers. Not only have I continued to use WeChat but I have also been able to access Mandarin newspapers, books, and TV programmes. In this regard, my confidence and capabilities in English have not been improved but without this social support, I am not sure that I would have been able to continue my studies.

Developing a supportive, virtual learning community for myself has been made possible through technology. In order to keep the learning community effective and active, the group should form around a specific affinity (in this case Mandarin speakers). If the community is too large, some members are lost and do not actively contribute. If the community is too small, it may not develop the impetus to form a supportive environment.

Reflecting on my whole doctoral journey, it is a complex process. When I started at the beginning of my hike, I was messing around, wondering the meaning and value of my work. As my research progressed, I received response, encouragement, and suggestions from my supervisors, and began to see the important points for me to have made. As a bricoleur–a researcher–my becoming process is always in the middle.

Conclusion

In this chapter, I assemble three Chinese student teachers' learning journeys with technology within the context of early childhood education, explore technology affordances in learning to teach, and critically reflect on my own doctoral study process.

To recall my research journey, I briefly introduce what I have learnt through this research:

- Learning to teach with technology is a complex becoming process full of uncertainty and possibility. Each student's journey of 'becoming teacher' is an evolutionary, iterative, and unique process, which is relational, non-linear, and emergent.

- Mandarin-speaking students, who value connectedness, group goals and harmony, academic achievement, effort, and diligence in learning, within a Chinese educational background, interact with new contextual factors when they study in the New Zealand context. They need to construct cultural identity to achieve a balance between two different cultures facing the problem of complexity, such as adjusting to the language, the academic expectation, and the social context.

- Technology is a constant in student teachers' lives. Their use of technology fluctuates since their needs and the context are always changing throughout their learning journey. Technology enables an interesting, convenient, and effective way to learn to teach. Building a community of learners, for social and professional reasons, appears to be the most important affordance. However, the feeling is that technology should not substitute for the warm teacher. Even though the student teachers have been experiencing using technology, they did not learn a lot about how to use it as a part of their pedagogy during this one-year programme.

- As a bricoleur, I am motivated and influenced by my own relational milieu. This bricolage accommodates the relationship between me–a bricoleur–and the objects of this research. I have used my bricoleur's perspective to paint a fluid picture of ambiguity. Reflecting on my whole doctoral journey, it is a complex process. As a bricoleur–a researcher–my becoming process is always in the middle.

- The study of learning to teach with technology is always 'in the middle'. How to maximise technology's affordances in teacher education still needs to be further explored.

In conclusion, the study suggests that supporting ECE student teachers to be proficient users of digital technologies in their professional practice is not straightforward nor linear. Rather, becoming pedagogically proficient is enabled by how technology is socially situated within, and distributed across, the social and professional contexts of the individual. This research is a bricolage of three Mandarin-speaking student teachers' learning journeys in an early childhood teacher education programme in the New Zealand context. As a bricoleur, I assembled their

learning stories based on the three fundamental problems and introduced technology affordances in their journeys. I interpreted these as a bricoleur–an international Mandarin-speaking student–to provide a lens through which to explore student teachers' interactions and relationships with others, with technologies, and with contexts. Their new learning stories are continuing and other new student teachers' stories are going to happen. Learning to teach is uncertain, dynamic, and open to various possibilities, as is the research of learning to teach.

Appendices

Appendix A: Educational Technology Baseline Questionnaire

THE UNIVERSITY OF AUCKLAND
FACULTY OF EDUCATION
Te Kura Akoranga o Tamaki Makaurau
Incorporating the Auckland College of Education

School of Curriculum and Pedagogy
The Faculty of Education
University of Auckland
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Ph: 09 623 8899 ext 48692

Educational Technology Baseline Questionnaire

These questions contain items that require you to tick a box or write short answers about your experience with educational technology, web applications and ePortfolios. It will be analysed to give us a better understanding of you as a cohort of student teachers and to inform our evidence-based, research-led practice. This questionnaire is also a part of a PhD research project aimed at exploring the journey of student teachers learning to teach with technology, which is approved by the University of Auckland Human Participants Ethics Committee. Reference number 018315.

Q1 How would you rate your overall skill in using educational technology? Tick the box that most applies to you below:

Below basic	
Basic	
Proficient	
Advanced	

Q2 How would you rate yourself in terms of your DISPOSITION towards using mobile technologies on the following continuum?

0----------10		
Reluctant	<---------->	Keen
Late adopter	<---------->	Early adopter
Risk-averse	<---------->	Risk-taker
Need support	<---------->	Independent
Follow rules	<---------->	Use initiative
Bah humbug	<---------->	Super cool

Q3 What mobile devices do you own – or borrow regularly to use. Tick all that apply:

Basic phone/no camera		Blackberry	
Basic camera phone		iPhone	
Android smartphone		iPod	
Android tablet		iPad	
Windows tablet		Mac laptop	
E-reader		PC laptop	
Other – please specify			

Q4 Please identify which of the following technologies you currently use for educational and/or personal purposes. Tick all that apply:

	Personal	Educational
Email		
Educational Websites		
Word, Excel, PowerPoint		
Chat		
WebQuests		
Social Networking – please circle from: Facebook, Myspace, Twitter, Flickr, YouTube (view only), YouTube (own channel), Vimeo, Instagram, Vine, Linkedin, Wordpress, Blogger, WeChat, Other (please specify):		
Google Docs		
Google +		
Google + communities		
Google Earth, Maps, Translator, etc.		
Blogs I follow		
Blogs I write		
Wikis		
RSS feeds		
Audio/Video Podcasts		
Audio, Video, and other Multimedia (not Podcasts)		
Other (please specify)		

Q5 Tick the most appropriate platform(s) for each activity. From this list of platforms which would you use for:

	Reflective journal (for personal learning)	Sharing thoughts, ideas and educational resources with peers	Collecting, storing and organising resources and artefacts	Presentation of artefacts for assessment	Uploading a video I have recorded myself & providing a reflective commentary on it.	Professional portfolio and CV	Have never used
Blogger							
Google Sites							
Wordpress							
Tumblr							
Weebly							
LiveBinders							
Pinterest							
Facebook							
Google+							
YouTube							
MoveNote							
Other Name:							
I have no idea which I would use for this activity							

Q6 Thinking about your own learning and coursework: Tick which apply to you in each column.

	I could be a more effective student if I were better skilled at using...	Which *resources/tools* do you wish your lecturers used less…or more (please specify)?
The course or learning management system (e.g., Canvas, Moodle)		
E-portfolios		
E-books or e-textbooks		
Simulations or educational games		
Freely available content beyond our campus (e.g., OpenCourseWare, Khan Academy, iTunes U, Mayo Clinic, etc.)		
Recorded lectures or “lecture capture” (for later use/review)		
Online collaboration tools (e.g., Blackboard Collaborate, Adobe Connect, Google Docs)		
A tablet/laptop/smartphone during class (for class-related, not personal, purposes)		
Social media as a learning tool		
3D printers		
Other - Name:		

Q7 Do you follow any educational wikis, blogs, Pinterest or Facebook pages? If so, can you list up to 5 favourites?

1.

2.

3.

4.

5.

Q8 In the past year, have you taken a MOOC (massive open online course) through any institution/organisation (e.g., Coursera, Udacity, edX, MITx, etc.)?

No, and I don't know what a MOOC is	
No, but I do know what a MOOC is	
Yes, but I didn't complete one	
Yes, and I completed one	

Q9. What is your age?

17 to 24	
25 to 34	
35 to 44	
45 to 54	
55 to 64	
65 to 74	
75 or older	

Appendix B: Example of Observation Field Notes

Observation, Monday, 21.08.2017

Course: Te Ao Māori Early Childhood Education

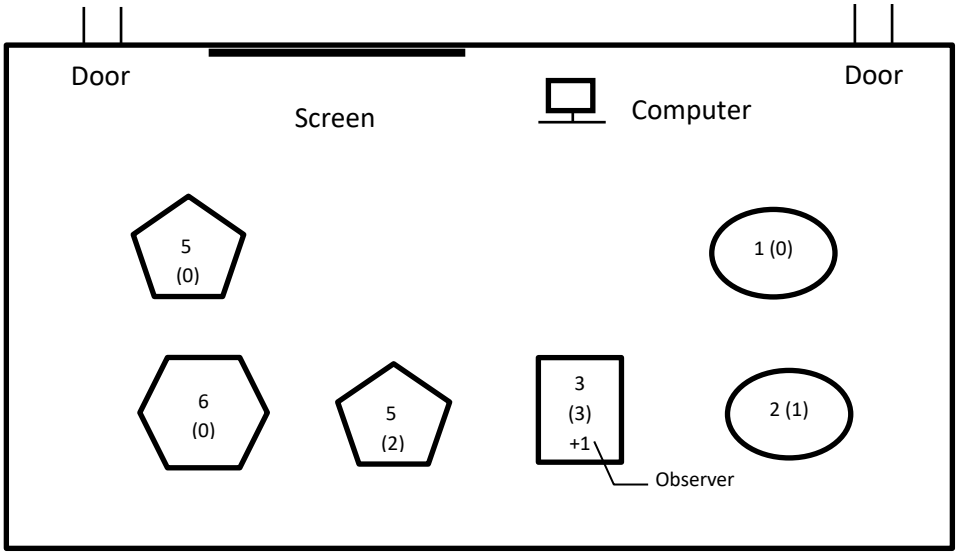
Time frame: 8.30am – 10.30am

Topic of the lesson: Te Tiriti o Waitangi

Classroom process: instructions through a PowerPoint Presentation on Māori history.

- warm-up: singing a Māori song;
- lead-in: discussing on what we know about the Treaty; watching a YouTube video clip on 'Te Waka: our great journey';
- illustration of the history of New Zealand: discussing how to teach history to children under 5; watching a video clip from eTV website about 'What Reality Happened';
- summary of the Treaty;
- activity: learning a Māori song.

Classroom setting: a simple line-drawing of the classroom setting is illustrated below.



Notes: different shapes represent different groups in the classroom;
the figures in the shapes represent the number of student teachers sitting in the group;
the figures between brackets represent the number of student teachers using a laptop.

- there is a projector screen and a computer in the classroom;
- student teachers are seated in groups in the classroom.

Engagement:

- Amy used her MacBook to take notes.
- Ben used his MacBook in the class. During the lesson, he downloaded the resource from the Canvas and made a to-do list on his laptop after this lesson.
- Connie used her pencil and notebook to take notes.
- The lecturer taught the student teachers a Māori folksong before the end of the class. The audio file and the lyric of the song had been uploaded on the Canvas. Firstly, the lecturer taught the students to sing sentence by sentence after him. Then the lecturer opened the audio file from the computer while the students sang with the audio. The playback speed of the audio was slowed down at the beginning for the students to catch up. In the end, the students could sing with the audio as usual speed.

Appendix C: Participant Information Sheet (Student Teachers)

EDUCATION AND SOCIAL WORK

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Participant Information Sheet

(student teachers)

Project title: Learning to teach with technology: Traversing the initial teacher education landscape

Name of researcher: Xue Yuan, PhD student at the University of Auckland

To: Students enrolled in Graduate Diploma in Teaching (Early Childhood Education)

I would like to invite you to participate in a research project called *Learning to teach with technology: Traversing the initial teacher education landscape*. The aim of this project is to explore the journey student teachers undertake as they learn to teach over the one-year programme. I am keen to understand how you make sense of the different experiences, contexts and activities that are involved in your teacher education course. In particular, I am interested in understanding how your use of technology influences your professional learning. I sincerely hope you will consider being a participant in this study.

Project procedures

The selection of participants is based on purposive sampling to obtain a group of participants who, on balance meet the following criteria:

1. Have a diversity of proficiency with digital technologies.

2. Have a diversity of views on the value of digital technologies to educational practice.

3. Have some proficiency with, or affinity to, speaking mandarin.

4. Share a common timetable and set of classes.

Being a participant will not be a time-consuming commitment on your behalf. I expect the total time commitment may be 4-8 hours. My research will involve you participating in individual and focus group interviews, and also analyzing the artefacts (which could be your study journal, assignments or anything else that you'd like to talk about) you create as part of course tasks.

I will use the interviews to help understand your experiences of learning to teach. There will be five interviews with each participant individually and two focus group interviews in total during your one-year programme. The interviews (0.5-1 hour each) are to explore how you see and experience the journey of becoming teacher and the role technology plays in mediating this. The observations will involve me sitting in some of the classes to get some first-hand experience of the contexts you are situated. If possible, it would enrich my understanding if we could also have some informal chats about these lessons and what I am observing. Mobile texts and apps such as WeChat could also be a convenient way for us to communicate. We can discuss what is most convenient for you.

I will also hold two focus group meetings where you can share and exchange your stories and experiences with other participants in the project. These will be around 1 hour long and provide an opportunity to reflect on your journey of becoming a teacher with technology and may benefit for the future teaching with technology.

Ethical issues for your consideration

Do I have to participate? Participation in this research study is completely voluntary. You are under no obligation or pressure to agree to participate in the project. The decision to participate is not connected to any course or programme requirement and will not affect your grades. Participation in focus groups (as well as individual interviews) is a matter of choice and not required of all who agree to participate in the overall project. If you agree to be a participant, you will need to sign a consent form. This voluntary participation also extends to you retaining the right to decide what information you share with the project. The individual interview will be audio recorded and you may choose to have the recorder turned off, without giving a reason, at any time during the interview. The focus group interview will be audio recorded and you can choose to remain silent if you choose not to answer a specific question.

Can I change my mind and withdraw after signing the consent form? Yes- you may withdraw from the project at any time, without giving a reason. You may withdraw your identifiable data, without prejudice, at any time prior to the analysis of data, December 1, 2017. You can withdraw any named data simply by contacting the researcher. In addition, during the interviews, you will also be able to withdraw from participation. If you choose to participate in a focus-group interview, you can withdraw from participation by leaving or by remaining silent, but you will not be able to withdraw any contributions that you have made up until that point.

Will the information I provide be confidential? The information you provide will be handled in a very careful way with sensitivity to keeping your participation confidential (which is not possible in a focus group situation). Given the small size of the pool of potential participants, it is not possible to guarantee the confidentiality of the participants' participation. I can assure you that in any reporting of the findings, pseudonyms will be used for all participants' contributions, quotes or comments. This will help ensure that you will not be identified as the source of any specific information. Anonymity can be assured on the data from the questionnaires.

To help ensure confidentiality, all data (computer and hard copies) will be coded prior to archiving, with all identifying information removed. Participant consent forms, data and audio recordings will be stored separately in a secure manner in the University of Auckland, Faculty of Education and Social Work, School of Curriculum and Pedagogy. All information will be held for a period of six years and then destroyed (hard copies destroyed by shredding, audio recordings and electronic data erased).

Are there any benefits for me being a participant? It is hoped that as a result of your engagement with this project you will:

- feel more agency in the program (have your voices 'heard');
- get the chance to reflect on your journey of becoming teacher with technology;
- have the opportunity to benefit for your future teaching with technology;
- get the possibility to share and exchange your stories and experiences with other student teachers with different backgrounds.

Consent

The Dean has granted permission for me to invite you, as a student teacher, to participate in this research. He has given an assurance that your participation or non-participation will have no effect on your grades or relationship with the lecturer.

You will all be given a consent form on which to Agree/Not agree to participate.

Thank you very much for your time and help in making this study possible. I look forward to working with you on this project. If you have any queries or wish to know more, please do not hesitate to contact me, my supervisors, or the Head of the School of Curriculum and Pedagogy.

Student Researcher name and contact details	Supervisors names and contact details	Head of the School name and contact details
Xue Yuan 09 373 7999 x.yuan@auckland.ac.nz	Associate Professor Alan Ovens 09 373 7599 ext. 48605 a.ovens@auckland.ac.nz Associate Professor Dawn Garbett 09 373 7999 ext. 48972 d.garbett@auckland.ac.nz	Associate Professor Helen Hedges 09 623 8899 ext. 48606 h.hedges@auckland.ac.nz

For any enquiries regarding ethical concerns please contact: The Chair, University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Tel 09 373 7599 ext. 83711. Email: ro-ethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13-FEB-2017 FOR THREE YEARS. REFERENCE NUMBER 018315.

Appendix D: Consent Form (Student Teachers)

EDUCATION AND SOCIAL WORK

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Auckland 1135

Consent Form(student teachers)
This form will be kept for a period of six years

Project title: Learning to teach with technology: Traversing the initial teacher education landscape

Researcher: Xue Yuan

I have read and understood the Participant Information Sheet. I have the opportunity to ask questions and have them answered.
I understand that:

- I will participate in semi-structured interviews/focus group interviews that will take between 30 and 60 minutes at time that does not clash with my studies.
- The interviews will be audio recorded, I can ask to have the recorder stopped at any time without any reason.
- I can choose to have the casual conversations I have with the researcher, either face-to-face or via digital technology to be used as a source of data for the study.
- My decision to participate or non-participate will have no effect on my grades or relationship with my lecturer.
- Confidentiality in focus group situations is difficult to maintain and that I can withdraw my participation by leaving the focus group interview or by remaining silent, but I will not be able to withdraw any contributions I have made up until that point.
- I agree to not disclose anything discussed in the focus group.
- I have the opportunity to receive a summary of the key findings per email if I want.
- All electronic data will be stored on password protected computers and that all hard copy data will be stored for six years in a secure location separate from personal details and then destroyed by deletion or shredding.
- Generalised information from this research will be disseminated via conferences and published in appropriate journals.
- My name and identifying information will not be used in any reports or recording of information.

I agree to participate in the following components of the research (please tick)

- ☐ Five individual interviews
- ☐ Two focus group interviews
- ☐ Short conversations with the researcher about a class activity
- ☐ Electronic communications with the researcher about class activity
- ☐ Contributing artefacts, such as my study journal, assignments or lecture notes to the researcher for analysis

Name: _____ Signature: _____ Date: _____

I wish to receive a summary of findings, which can be emailed to me at this email address: _____.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13-FEB-2017 FOR 3 YEARS. REFERENCE NUMBER 018315.

Appendix E: Lecturer Information Sheet

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

EDUCATION AND SOCIAL WORK

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Auckland 1135
New Zealand

LECTURER INFORMATION SHEET

Project Title: Learning to teach with technology: Traversing the initial teacher education landscape
Researcher: Xue Yuan, PhD student at the University of Auckland

Description of the project
The aim of this project is to explore the journey of student teachers learning to teach with technology through initial teacher education. I will explore how students experience and traverse the landscapes of teacher education. In order to experience first-hand what opportunities the students have to interact with technology I would like to sit in some of their classes. That way, when we meet to discuss their experiences, I will have better understanding of how they learn in, through and about technologies in class. I will not be collecting data for the study, but I may note down aspects of the lesson to help prompt discussion with the participants during the interviews.

Consent
I am seeking permission from you for the following:

1. To attend some of your classes in order to help my understanding of the process of learning to teach.
2. To have access to a printout of how frequently and for what purpose students interact with the LMS system Canvas.

The Dean has given an assurance that your participation or non-participation will have no effect on your relationship or employment with The University of Auckland.

Right to withdraw
I will always ask you at the start of the session if it is appropriate that I attend the lesson. You can refuse to have me sit in your class at any time. You have the right to withdraw any information provided about the students' interaction with the LMS system Canvas at any time prior to the

analysis of data, December 1, 2017, without giving a reason. You may withdraw by contacting myself, supervisors or Head of my Department.

Confidentiality

Attending your class is only providing a backdrop for my personal understanding of the context that students' experience as part of learning to teach. In any reporting of findings, pseudonyms will be used for all participants' non-anonymous contributions, quotes or comments. No courses or lecturers will be identified or named. The print-out of LMS participation you provide will have all identifying information removed. Participant consent forms and data be stored separately in a secure manner in the University of Auckland, Faculty of Education, School of Curriculum and Pedagogy. All information will be held for a period of six years and then destroyed (hard copies destroyed by shredding, audio recordings and electronic data erased).

The information gathered will be used to inform teacher education practice and for research purposes only. If the information provided is reported/published, this will be done in a way that does not identify any individual as its source.

Benefits

It is hoped that as a result of their engagement with this research project that students will feel more agency in the programme (have their voices 'heard'), get the chance to reflect on their journey of becoming teacher with technology, have the opportunity to benefit for their future teaching with technology, and get the possibility to share and exchange their stories and experiences with other Mandarin-speaking student teachers.

Thank you very much for your time and help in making this study possible. I look forward to working with you on this project. If you have any queries or wish to know more, please do not hesitate to contact me, my supervisors, or the Head of the School of Curriculum and Pedagogy.

Student Researcher name and contact details	Supervisors names and contact details	Head of the School name and contact details
Xue Yuan 09 373 7999 x.yuan@auckland.ac.nz	Associate Professor. Alan Ovens 09 373 7599 ext. 48605 a.ovens@auckland.ac.nz Associate Professor Dawn Garbett 09 373 7999 ext. 48972 d.garbett@auckland.ac.nz	Associate Professor Helen Hedges 09 623 8899 ext. 48606 h.hedges@auckland.ac.nz

For any enquiries regarding ethical concerns please contact: The Chair, University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Tel 09 373 7599 ext. 83711. Email: ro-ethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13-FEB-2017 FOR THREE YEARS. REFERENCE NUMBER 018315.

Appendix F: Consent Form (Lecturer)

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

EDUCATION AND SOCIAL WORK

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Auckland 1135
New Zealand

CONSENT FORM
(Lecturer)
This form will be kept for a period of six years

Project Title: Learning to teach with technology: Traversing the initial teacher education landscape
Researcher: Xue Yuan
I have read and understood the Participant Information Sheet. I have had the opportunity to ask questions and have them answered.
I agree that this research may be conducted as outlined in the PIS.
• I understand that you'll ask permission at the start of every session to attend the lesson and I have the option to decline.
• I will provide you with a copy of the participants' interaction with the LMS system Canvas data as a printout at the end of the course.
• I understand that there is no obligation for the students to participate in this research.
• I am informed that there will be no impact on my employment regardless of participation or non-participation, assured from the Dean.
• I understand that all electronic data will be stored on the researchers' computers with standard protected password security and protocols. All other data will be securely stored in the locked cabinet provided for research material in the School of Curriculum and Pedagogy with the consent forms stored separately.
• I understand that all electronic data will be erased and all paper data shredded after 6 years as prescribed by the university regulations.

Name: _____
Signature: _____
Date: _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13-FEB-2017 FOR 3 YEARS. REFERENCE NUMBER 018315.

Appendix G: Request for Site Access Information Sheet (Dean)

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

EDUCATION AND SOCIAL WORK

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Symonds Street
Auckland 1135
New Zealand

REQUEST FOR SITE ACCESS INFORMATION

Project Title: Learning to teach with technology: Traversing the initial teacher education landscape

Researcher: Xue Yuan, PhD student at the University of Auckland

Dear Professor Aitken,

I seek your support for a PhD research project aimed at exploring the journey of student teachers learning to teach with technology through initial teacher education. I will investigate how a group of Mandarin-speaking students experience and traverse the landscapes of teacher education and what affect does learning to teach with technology have on student teachers becoming teachers.

I am seeking permission from you for the following:

1. To approach and invite five Mandarin-speaking student teachers from the Graduate Diploma in Teaching (Early Childhood Education) to be participants in my research project. As a participant, the student will be asked to:
    a. Participate in five interviews (0.5-1 hour each) in which they discuss their experiences of becoming a teacher.
    b. Participate in two group meeting where the participants will get to know each other and have the chance to share their experiences and stories with each other.
    c. Occasionally communicating through texts and WeChat app as appropriate.

2. Your assurance that participation or non-participation will have no impact on the student grades or relationship with the department/faculty.
3. To have site access to observe these students in the contexts of their teacher education (courses, lessons and CANVAS LMS interactions). Such observations are intended to help me contextualise my understanding of the students' experiences. If granted, each course lecturer involved will be approached for their consent to attend lessons and note aspects of the experience that can be used to prompt discussion in the interviews.
4. Your assurance that the lecturers' standing in the faculty will not be affected by whether or not being a participant in the project.

Ethical issues for your consideration

- Right to participation or non-participation

The students are under no obligation to participate in the research. A Participant Information Sheet will be given inviting all students to participate in the research project and outlining what is required of them. They will each sign a consent form before becoming a participant. Similarly, the lecturers are under no obligation to participate in the research or have me attend their lessons. A Lecturer Information Sheet will be given and I will seek permission prior to attending any lesson. Each participating lecturer will sign a consent form.

- Right to withdraw

Students may withdraw from the project at any time, without giving a reason. They may withdraw any named data, without prejudice, at any time prior to the analysis of data, December 1, 2017, simply by contacting the researcher. If students choose to participate in the focus-group interviews, they will be able to withdraw from participation, but will not be able to withdraw comments they have made up until that point.

- Confidentiality

Every effort will be made to ensure that the source of information provided for the study cannot be identified. In any reporting of findings, pseudonyms will be used for all participants' contributions, quotes or comments. The interviews will be digitally recorded. All data (computer and hard copies) will be anonymised and interview transcripts will be coded prior to archiving, with all identifying information removed. Participant consent forms, data and audio recordings will be stored separately in a secure manner in the University of Auckland, Faculty of Education, School of Curriculum and Pedagogy. All information will be held for a period of six years and then destroyed (hard copies destroyed by shredding, audio recordings and electronic data erased).

The information gathered will be used to inform teacher education practice and for research purposes only. If the information provided is reported/published, this will be done in a way that does not identify any individual as its source.

Benefits

It is hoped that as a result of their engagement with this research project that students will feel more agency in the programme (have their voices 'heard'), get the chance to reflect on their journey of becoming teacher with technology, have the opportunity to benefit for their future teaching with technology, and get the possibility to share and exchange their stories and experiences with other student teachers with different backgrounds.

Thank you very much for your time and help in making this study possible. I look forward to working with you on this project. If you have any queries or wish to know more, please do not hesitate to contact me, my supervisors, or the Head of the School of Curriculum and Pedagogy.

Student Researcher name and contact details	Supervisors names and contact details	Head of the School name and contact details
Xue Yuan 09 373 7999 x.yuan@auckland.ac.nz	Associate Professor Alan Ovens 09 373 7599 ext. 48605 a.ovens@auckland.ac.nz Associate Professor Dawn Garbett 09 373 7999 ext. 48972 d.garbett@auckland.ac.nz	Associate Professor Helen Hedges 09 623 8899 ext. 48606 h.hedges@auckland.ac.nz

For any enquiries regarding ethical concerns please contact: The Chair, University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Tel 09 373 7599 ext. 83711. Email: ro-ethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13th February 2017 FOR THREE YEARS. REFERENCE NUMBER 018315.

Appendix H: Consent Form (Dean)

EDUCATION AND SOCIAL WORK

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Auckland 1135

CONSENT FORM
(Dean)
This form will be kept for a period of six years

Project Title: Learning to teach with technology: Traversing the initial teacher education landscape
Researcher: Xue Yuan

I have read and understood the Site Access Request. I have had the opportunity to ask questions and have them answered.

- I understand that participants will be sought while they are students of the Faculty and therefore consent is needed to approach them.
- I understand that there is no obligation for the students to participate in this research.
- I give assurance that there will be no impact on students' grades or relationship with the department/faculty by either participation or non-participation.
- I give assurance that there will be no impact on lecturers' employment by either participation or non-participation.
- I understand that all electronic data will be stored on the researchers' computers with standard protected password security and protocols. All other data will be securely stored in the locked cabinet provided for research material in the School of Curriculum and Pedagogy with the consent forms stored separately.
- I understand that all electronic data will be erased and all paper data shredded after 6 years as prescribed by the university regulations.
- I understand that participants' identifying information will not be used in any reports or recording of information.

I agree that research may be conducted in this programme.
I agree that the students may be approached to take part in this research.

Name: _____
Signature: _____
Date: _____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 13th February 2017 FOR 3 YEARS. REFERENCE NUMBER 018315.

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