THE VALUE OF A SCHOOL BASED DIGITAL LEARNING FRAMEWORK: DOES IT OFFER THE SUPPORT AND GUIDANCE NEEDED FOR TEACHERS OF VARYING DIGITAL CAPABILITIES?

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Abstract

Digital technology use is widely debated in teaching and learning, particularly in deciding how students learning experiences are being transformed and how teacher’s pedagogical knowledge informs best practice in terms of 21st century skills. This project explores the use of digital devices in one school and how learning experiences are planned to accommodate digital technology. This study tells a story of teacher’s different understandings of digital learning experiences based on their capabilities. The participant’s stories also highlight the challenges of digital technology use, from their perspective. The study also explores a resource developed from international educational frameworks and whether it supports the pedagogy required to implement a digital practice.

The study draws on the tradition of practitioner research. The data gathering methods used to collect qualitative data were semi-structured focus group discussions and a semi structured interview with each participant. The focus group discussions were relevant to how a Digital Learning Framework (DLF) could help or hinder teachers developing implementation of digital technologies, and invited their views on what could be done to further support teacher's digital practice at this school. A semi-structured interview was conducted with teachers who participated in the study, to inform what understandings and pedagogical approaches were being used by participants to integrate digital technologies into teaching practices.

The key findings of the study highlighted the benefits and challenges of developing digital pedagogies and further to this the support required to improve the use of digital technologies within teaching and learning in this school. The findings were correlated from the "views and opinions of the teacher participants on
a) The value of a school based Digital Learning Framework as a resource for planning.
b) Participants experiences implementing digital technology into their practice with minimal guidance and support.
The recommendations of the study are that the challenges teachers face when implementing digital technology could be alleviated through: Professional development with teacher colleagues who have the expertise and are given extra release to research, identify appropriate PLD specific to digital pedagogy and practice in order that they maintain manageable workloads. Teacher feedback can be sought and utilised to ensure professional development is meeting the needs of its participants. Time to apply new learning to practice (Timperley et al, 2007) is important to adopting a focus on pedagogy that includes digital approaches identified in the DLF and research. Alongside this, it is suggested that internal expertise is developed further in order to build capacity across the school in digital pedagogy and practice.

A collaborative approach between senior and middle leaders alongside teachers when developing and delivering digital learning experiences may help towards a more open and supportive environment for teachers to share their views and opinions. It would also assist with leaders seeing the challenges first hand, enabling them to put in place support and focused solutions.
Preface

Ko te manu e kai ana i te miro, nōnā te ngāhere. Ko te manu e kai ana i te mātauranga, nōnā te ao. *The bird that consumes the miro berry owns the forest. The bird that eats knowledge owns the world. (korero tuku iho)*.

This whakatauki speaks to taking my learning outside of the space I am comfortable in and where I am considered a leader of learning. It speaks of broadening my understanding of education by expanding on the knowledge I have through the guidance and information of researchers around the world in a space where I am a learner.

I write as a woman of Māori (Tuhoe, Ngati Porou) and Pakeha descent. I am a mother and grandmother and work in the education sector as a teacher in an Intermediate school.

Born in the late 1960’s I was educated within a system that Berryman, Kerr, Hikairo Macfarlane, Penetito & Smith (2012) argue did not celebrate or acknowledge Māori, cultural values or experiences. Growing up in a large city I was lost to the Māori culture of my mother and had no concept of what a half caste (term used by the teacher in 1973 and 1974) was, until the first two teachers I had in my early school years, pulled me to my feet by my elbow and admonished me for not knowing that I was half Māori (Maa-ree was their pronunciation). The term “caste” carries with it such deficit connotations for indigenous people. Brown (1984) pointed out when taking school statistical information the majority of teachers who were European, classed half caste children into categories based on their idea of how Māori they were. My recollection was of half caste and Māori children (myself included) being stood up in front of the class.

These experiences contributed to a mental block to my acquisition of te reo Māori. Spending many hours as an adult trying to catch it, possibly because of the era I grew up in where being Māori was not ever something to be proud of. In 2018 my journey to catch not only te reo Māori but also tikanga began.
During my teen years with my mother was where I started to learn about being Māori. Hall & Du Gay (1996) defined culture as all the learned behaviours, beliefs, norms, and values that are held by a group of people and passed on from older group members to newer members. My first experience of whanaungatanga, manaakitanga and tikanga as well as Te Reo was through my maternal grandparents. Being Māori in my early life, was something I was made to feel ashamed of by teachers, as identified by Naylor (2006), and in some instances my paternal grandmother who spoke of the Māori language as being a dead language and we would make more of ourselves learning Japanese. She also often spoke of my mum as being a good Māori (Maa-ree) girl, which in hindsight was condescending.

As a teacher, I see many children in schools now who have no idea about who they are as Māori. I see a disconnection from their culture and disregard for the customs and tikanga of their grandparents or great-grandparents. For some students, their culture, their language or identifying which Iwi or Hapu they belong to is not important. I see in them how I was; no understanding of the richness of their identity within a culture of belonging.

Easton (2018) perceived my mother’s generation were lost to the urban drift that took Māori to cities in New Zealand pursuing employment and away from their papakainga (ancestral land, home). Mikaere (2003) also identified a generation of language and tikanga lost through marriage between Māori women and other cultures, particularly European/Pakeha, which were dominated by the husband. My generation lived with the outcome of these actions and traversed an educational setting of the seventies and eighties that Berryman, Kerr, Hikairo Macfarlane, Penetito & G H Smith, (2012) recognised as having no place for differences of race or culture except for statistics that put Māori on the bottom rung of most educational outcomes. Bowers (2016) talks of this current generation as further disconnected not only of their culture but of societal values and skills, because of handheld devices and game controllers. What they can access comes without filters, open to both what is good and what is bad in this world.
A focus on digital technology in education came about through observations made within the participating school. Prensky (2016), contends that although children are spending countless hours, possibly more than necessary in front of screens, it is now part of their culture. Digital technology is the knowledge base of this generation and should be used to build on the skills necessary for them to function in a world where the traditional ideas of work, having a job, survival and being part of a community has radically changed.

Karoly & Panis (2004) highlighted the rapid technological changes and an increase in global competition which feature the skills and thinking attitudes we need to prepare our students with. Further, Karoly & Panos (2004) identified shifts in the nature of business and the increase in new areas of employment, favouring strong non-routine cognitive skills, such as abstract reasoning, problem-solving, communication, and collaboration. For students to be able to move into their best as adults, they need to be given the best by their teachers not only in the key learning areas that dominate education but also in the digital and adaptive technology that children are using socially and within learning now.
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I would like to acknowledge the people who gave me a push, gave me guidance, inspired me and helped me to understand more than my own perspective of teaching and learning. My husband: Frank Ngatoro. My children, mokopuna and my parents.

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Monique Ngatoro
Chapter One - Background

1.1 Introduction

Career opportunities are changing. Social Influencers are becoming the norm, these entrepreneurs are taking advantage of the high number of social media users and are paid to promote products and services. We have graphic design artists who develop the latest trends in gaming, programmers and coders who develop space technology, robots for the office and industrial labour. There are many ever increasing career opportunities tied to technological advancements (Te Puni Kokiri, 2018).

Nikki Kaye, the former Minister of Education (2017) believed that the world was changing and to keep pace, the door must be open to the transformation of education. She advocated for teachers to develop their practice to include digital technology, by creating a learning environment that added value and encouraged students to build on their current digital experiences. She proposed that teachers engage with 21st Century tools, resources and skills and harness the range of technologies available now. As educators, teachers are required to create relevance to their practice by upskilling in digital technology, adding value to the future employment prospects of their students and developing their practice towards future focused learning.

Keeping pace with the technological advancements as Nikki Kaye (2017) suggests allows our students to compete with the rest of the world, as well as opening career opportunities in Science, Technology, Engineering and Maths for students of all cultures in order to access employment prospects in any part of the world. Lindner Lindner (2006, p. 41) states:

“To prepare our students we cannot continue teaching and learning concepts that are still based on a tool paradigm where technology is seen as a medium for delivering instructional content faster, to make it more manageable and just
to target students’ interest. This implies that we simply replace the old tool – blackboards, textbooks, and overhead projectors, with the new tools smartboards, iPads and websites. Undoing the cognitive damage of this type of thinking is key to effectively transitioning from a traditional pedagogy to an appropriate digital pedagogy.”

Central to Nikki Kaye’s advocacy for student’s teaching and learning to be transformative and teachers to develop their practice to include digital technology. It is imperative that teachers are provided with the support they require to create a learning environment that builds on current digital experiences.

1.1.1 Chapter outline

This chapter begins with a personal statement in order to clearly identify the position and the context of this study. This is followed by the research aim, questions and rationale. It was important to construct this research project by establishing background information from an educational perspective in order to contextualise where the gaps are in teacher practice and why there are gaps, especially in isolated regions where Professional Development with digital technology is not as accessible. Therefore the following sections in this chapter seek to determine whether a digital learning framework in the form of a document that steps out examples of digital learning experiences based on outcomes in areas targeting digital skills would support teacher practice.

The setting of this research project is based on 2017 teachers/educators and their developing use of technology within the participating school. A description of the school where the research takes place will be presented.

The results of this research project might test my hypothesis that a Digital Learning Framework is needed to provide guidance within New Zealand classrooms. The
The research project might also assess whether a Digital Learning Framework provides a starting point for teachers who for various reasons need help with assimilating digital technology.

### 1.1.2 Location of Self

As a multidisciplinary classroom teacher working in the mainstream primary-education sector, upskilling and improving to add value to students learning is part of the process of meeting every student where they are at. Although some things are done well, developing further as a teaching professional requires a critical view. This quote by Winter (1988, p. 231) resonates with personal experiences and development as articulated by in-school Professional Development, “We do not ‘store’ experience as data, like a computer: we ‘story’ it.” Self-reflection is fundamental to development. It determines the success or continuous reassessment of what teachers try to achieve.

### 1.2 Research Context

The research undertaken in this thesis was conducted using a practitioner research approach which aligns with Scheerens (2010) argument that research projects are contextualised as a means of promoting professional learning. The assumption is that practitioners will contribute to creating meaningful, generalisable knowledge and contribute to the transfer of this knowledge into practice. Ongoing analysis of pedagogical approaches based on research allows teachers to develop in areas meaningful to them (Lunenberg, Dengerink, & Korthagen, 2014).

The use of Kaupapa Māori methodology is also appropriate to the context of this research. The practitioner as well as a majority of the participants are Māori. The gathering and analysis of participant’s stories requires respect for their knowledge and
valuing the varied perspectives based on their experiences (cultural and teaching practice).

The context for this study was to explore the challenges teachers are encountering when trying to assimilate digital technology into their practice. This research was initiated from the perceived needs of teachers, including myself who were tool and task driven being given digital devices for teaching and learning with minimal guidance to its use. This project also sought to adapt a Digital Learning Framework (DLF) that included progressions. The progressions would define the depth of teaching and learning attached to learning outcomes in a digital context by highlighting possible next steps for students.

Professional Learning Development (PLD) is important to teachers being current, effective practitioners. PLD keeps teachers up-to-date on new research on how children learn, emerging technology, new curriculum resources, and more. The best professional development is ongoing, experiential, collaborative, and connected to and derived from working with students and understanding their culture (Edutopia Blog, 2008). PLD is also determined by priority areas of importance in schools which will be explored in order to ascertain the priority given to digital fluency in teacher practice. The impact of PLD will be further examined to identify teachers’ capabilities and difficulties with digital fluency.

Examining how teacher’s digital knowledge is related to the implementation of digital technologies in their teaching and learning programmes will be explored and whether Leadbeater’s (2005) argument that teaching practices haven’t gone far enough with digital use is certainly worth exploring within current educational settings. Leadbeater (2005) continues his argument that digital technology could be potentially transformative but are still being explored within teacher centric pedagogies. This is supported further by Mama & Hennessy (2013), teachers who prefer teacher-centric pedagogies find the student centric rationale for digital learning difficult to accept.
1.3 Research Aims and Questions

The aim of this research is to conceptualise a Digital Learning Framework (DLF - appendix A) that may provide guidance within teaching and learning that supports the integration of digital technology into teacher practice.

*Research Questions*

1. Can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?
2. What evidence will there be that the DLF can make a positive difference to teacher’s digital practice?
3. How will the DLF progress professional dialogue and guide decisions for teacher’s digital development?

1.4 Rationale

This research project describes the changing face of education and the value placed on digital technology and how it has been adapted into teachers practice. The study also explores the support required from Professional Learning Development (PLD) that determines whether pedagogical change is required to enhance digital learning experiences and develop teacher practice.

The view of transformative practice trumpeted by proponents of digital technology in education (Chien, 2012; Mama & Hennessy 2013; Ertmer, Ottenbreit-Leftwich, & York, 2006-2007) is challenged in this research. Teachers are constantly changing online resources for a number of reasons. Digital teaching can be perceived as ‘gimmicky’ (Blundell, Lee & Nykvist., 2016) which highlights the intrinsic challenges related to teachers personal trials when faced with assimilating digital knowledge into practice.
Such as online apps that get in the way of the core essentials: relentlessly high standards and expectations of students, flexible and varied teaching strategies and regular, precise feedback (Quigley, 2013).

A Digital Learning Framework (DLF) was considered in relation to the support offered to teachers of varying digital capabilities. The goal of the DLF is to help teachers develop digital learning experiences, think of appropriate pedagogies that would align to intended outcomes, support day to day planning, and create better opportunities for teachers and students to collaborate and explore learning using technology to enhance their learning experience.

1.5 Key terms used in this research

Digital fluency as described by Miller and Bartlett, (2012) is having the skills to decide when to use specific digital technologies to achieve a desired outcome. The essence of digital fluency is to make core critical thinking and information literacy skills relevant to the new challenges of the digital environment. Miller and Bartlett (2012) go on to further suggest that the digitally literate can articulate why the tools they are using provide their desired outcome. They also see digital fluency as combining old techniques; those classic skills necessary for any critical engagement with information; with new and specific knowledge bases, like how the internet works and keeping safe while utilising the resources and tools.

The term “Digital practice”, does not only apply to practice in education. It covers the spectrum of all users of digital technology described by White (n.d) as developing innovative solutions to complex problems. According to Siemens, Stewart, McAuley, & Cormier (2010)
“Practice” applies to a way, method or action being applied within digital networks or economies.

The more traditional theory of teaching practice as reported by Lave & Wenger (1991) is entrenched in experience-based learning that was initiated by Dewey (1938) and Vygotsky's (1978) social cognitive theory, and founded in the premise of situated learning. Highlighted here is a gap between the more traditional approaches to teaching and approaches relevant to the digital age. Lave and Wengers (1991) idea of Practice applies solely to the experiences situated in the learning, caused by the teacher while Siemens, Stewart, McAuley, & Cormier (2010) apply learning to the actions taken within digital contexts.

Pedagogy is defined by Siraj-Blatchford, Sylva, Muttock, Gilden & Bell (2002) as the instructional techniques and strategies that allow learning to take place. It refers to the interactive process between teacher/practitioner and learner and it is also applies to the provision of some aspects of the learning environment (including the concrete learning environment, and the actions of the family and community).

Digital Pedagogy at its core is an acknowledgement that the space of learning is more fluid and adaptable. Morris (2014) acknowledges that students can be in control of their own learning. Students will choose to process and curate their learning in digital spaces, so teaching how to use particular tools is not as vital as teaching how to choose tools for their particular use. This approach allows for ubiquitous learning spaces.

A popular definition of Ubiquitous learning as described by Hwang (2014) is learning anytime and anywhere. This definition is borne from the huge development of mobile and adaptive technologies which allows students and educators to stay connected wherever they are, whatever the time. It debunks the idea that learning can only be accessed in a classroom with four walls.
Professional Learning Development (PLD) as defined online by Te Kete Ipurangi. (2015)

“The provision of support for leaders and teachers to improve student achievement outcomes, particularly for priority learner groups, across a number of identified areas.”

The expectation is that PLD is a major lever for raising and accelerating student achievement.

The Digital Learning Framework (DLF) adopted and then used in this study has a similar definition as the e-learning Planning Framework (Te Kete Ipurangi, 2018). This suggests a Digital Learning Framework is a common reference with descriptors of digital competence for teachers and school leaders promoting innovative pedagogical approaches which embed the use of digital technologies. The Digital Learning Framework should be viewed as an enabler of self-reflection and improvement and not as an inflexible check-list.

The term 21st century learning is referred by the Great Schools Partnership (2016) and White (2011), as a broad set of knowledge, skills, work habits, and character traits that are believed by educators, employers, and others to be critically important to success in today’s world, particularly in contemporary careers and workplaces. While the term is widely used in education, it is not always defined consistently.

Rachel Bolstad (2011) a senior researcher for New Zealand Council for Educational Research relates future focused learning to valuing the input and interests of students and the learning content they engage with as reflective of those interests and shaped by what teachers know to be important knowledge.
1.6 Background

The rapid development of devices, tools and apps, requires teachers to keep up with technological advancements in education or feel left behind. An example from my own experience would be the use of drones. Students are using drones to capture live footage of events from above. Their footage had to be planned, deliberate and then edited. They are utilising the skills they have as gamers to fly the drone, which is managed by a handheld control. Students are developing skills within this educational experience that are important to their future employment. Such as, problem solving, critical thinking, creativity, collaboration, communication and inclusiveness. While the teacher doesn’t have to know how to fly the drone, their pedagogical knowledge develops the key competencies and progressions of learning for the students. Future-focused Education senior advisor with CORE Education, Mark Osborne (2016) considers digital technology, in this case the drone, as the hook into learning.

Digital pedagogical competence or proficiency in using digital technology in teaching was deemed by Laurillard, (2012) as an awareness of its implications for learning as a crucial skill for the 21st century. According to Fullan & Langworthy (2014) pedagogy creates the connection between the teacher and what is to be taught, the student and what is to be learned, and how technology teaching and learning is brought together to improve or lift the learning experience. The theoretical concept of digital teaching and learning requires a massive change in the relationship between teachers and students. Challenging students to solve “authentic” problems or acquire complex knowledge in information-rich settings and teachers allowing learners to construct their solutions independently or with input at the request of the learner; was identified by Kalantzis & Cope, (2010) as leading to the most effective learning experiences.

1.6.1 Digital Pedagogy

Wilson (2015) wrote about Rowena Phair who was the Ministry’s "head of student achievement" in 2012. She thought that it was increasingly important for school
leavers to have the skills to succeed in the digital age. She further accepted that a student with their device could "learn anytime and anywhere," and "connect and collaborate" with students and experts outside the school. Dudding (2014) saw the bonus of digital technology was having access to lots of great online educational resources and that the role of teachers was to design digital experiences that substantiate the role of technology in society in line with the skills required by future employers.

Davidson & Goldberg (2009), Harasim (2011) and O'Hara, Pritchard, Huang, & Pella (2013) claim that digital pedagogy is needed to break down the central role of the teacher and support students' independent learning and initiatives within ubiquitous frameworks

1.6.2 Digital Practice.

Spencer (2009) asserts, expert teachers improve the digital practice and capabilities of their colleagues by modelling what it looks like and believes that the tools they are using are effecting change for their students. She identified that teachers are deliberately making pedagogical decisions in order to develop learners; crafting lessons based on their analysis of where their students are in the present and, consider what steps are necessary for them to improve. Furthermore teachers are advocates for their students to think wider and more critically around their options for investigation. Using digital tools they guide and communicate success or reassess in order to add value to learning.

Lai (2008) expects a paradigm shift through digital practice will force the application and method of teaching into a digital context. Furthermore, the retention of traditional teaching in an environment where digital technology can enhance learning experiences and motivation of students does not make sense in a digital practice.
Students need some autonomy to develop problem solving processes and communication in a collaborative context. Fullan & Scott (2014) identified, holding students to the processes and methods of learning that does not go outside of what the teacher knows is no longer viable especially in a digital environment, which lends itself to collaborative practices, between both student to student and student to teacher.

1.6.3 Success and building capacity

Stoll (2009) defined capacity building as a focus on helping teachers collectively see, think and do things differently to improve all students learning; and find ways they can provide the conditions, environment and opportunities for their colleagues to be creative. Dialogue between colleagues can provide an understanding of practice in a number of key learning areas, however it can also be deemed as the blind leading the blind, especially if the pedagogy is not sound and colleagues are only providing suggestions for digital use. Further to Stoll’s (2009) argument, capacity for change is all about learning and engaging as individuals and that this kind of learning has inherent benefits for teachers connected to sustainability: sustainability of inquiry and reflection and sustainability of conversations inside and outside the school.

1.6.4 Location; a game changer

Digital technology PLD is predominantly based in main centres such as Auckland and Wellington. Schools who send their teachers to a main centre, have to provide for the cost of the PLD, accommodation and travel. In the regions, it is harder to access the type of PLD being offered in the larger cities, like Wellington and Auckland. This means that rural teachers and those in isolated regional areas, like Gisborne don’t get the frequency and on-going access to digital technology PLD, which is crucial for school-wide development across all teaching and learning areas. Google Apps for
Education Summits and the development of technological practice rarely see the sun in the regions. Furthermore the government through Education Services, (2018) have made access to PLD quite cumbersome. The process involves teachers applying (usually as a group within the school or from a Community of Learning (CoL)) to a centrally provided fund of money. A panel determine whether your application fits within the criteria and if approved you then have to choose a facilitator. The facilitator works to develop a plan with the school or CoL as to the specific needs and priority areas identified. This process seems very long.

Smaller regions create their own groups, as a way to share knowledge, but have found that exposure, experience and sometimes pedagogical knowledge is limited to the same people which further supports the premise that smaller regions aren’t always catered for in terms of PLD engagement, especially in the area of technology. However it is vital that teachers are exposed to useful, intentional learning development with digital technology that includes best practice and pedagogy.

1.7 Digital Learning Framework (DLF)

The aim of the Digital Learning Framework for this research project was to provide teachers with guidance around what would make good pedagogical sense when deciding how to plan digital learning. What it would look like and how it would guide teachers was not clear starting out. The DLF did have to start from Learning Outcomes, as these inform pedagogical approaches, which each teacher needed to develop independently. The Learning outcomes would then have examples of how digital technology could be assimilated into the learning experiences which could then be adapted by teachers based on their pedagogical approaches.

Researching digital technology frameworks in education would have to be broadened to other countries because the New Zealand Curriculum had not updated the
technology outcomes at this point in my research project. I was also looking for a model that would assist digital learning by giving teachers examples of what could be done to enhance their pedagogical approaches with digital tools and resources.

During this study, teachers on a Facebook group were seeking support with digital progressions and wanted to know how other teachers were integrating digital technology in their practice. Teachers are wanting a resource or tool to help them use technology to stimulate interest, provide relevance, support creativity, and create collaborative learning experiences for all students (Ministry of Education, 2019).

1.8 School setting

The study school is a mainstream intermediate (years 7 and 8) situated in the outer limits of a provincial city in Aotearoa New Zealand. The year this research was undertaken, the school employed twenty teachers, eleven support staff, including the office, caretaking and cleaning staff.

<table>
<thead>
<tr>
<th>Ethnicities</th>
<th>Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori</td>
<td>38%</td>
<td>71%</td>
</tr>
<tr>
<td>NZ European</td>
<td>54%</td>
<td>21%</td>
</tr>
<tr>
<td>Pasifika</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

(‘Other’ students include Asian, Latino, British/Irish and American).
The ethnicities of the four hundred and twenty eight students and a decile rating of one (ten is the maximum decile rating that schools can have) indicates a significant proportion of students were from low socio economic areas. The Intermediate setting caters to students transitioning between primary and secondary education with teaching classrooms, an administration block, library, gym, swimming pool, hall, and Tech classrooms where music, drama, food & nutrition, te reo ona tikanga Māori and art are taught as specialist subjects.

The participant school draws students from five contributing schools in the area, and all but two of them have a similar decile rating. The participating school alongside many other schools in New Zealand has invested tens of thousands of dollars into digital infrastructure and resources, including faster Ethernet, Chromebooks, iPads, tablets and digital programmes like Maths Buddy, Banqer, and Languagenut. Most classes in the participating school have between fifteen and twenty four Chromebooks and access to iPads and tablets.

The vision of the school, is underpinned by high expectations and a strengths-based philosophy of student learning. ERO, (2014) refers to students learning centres as being structured to cater for self-identified strengths, maximise student interests, and encourage engagement. The school’s senior management team established groups called Matauranga for core learning areas in 2017, which invited teachers to teach from areas of strength, with PLD structured to accelerate student learning within teams and individually.

1.9 Summary

So far, there is research to suggest that digital learning sets an even playing field in the education of social and ethnic minorities, however, integral to that outcome is teacher practice (Du, Havard, Sansing & Yu, 2004). Research also supports the Select Committee’s inquiry into 21st Century Learning spaces and Digital Literacy.
(Education and Science Committee, 2012), that supporting 21st Century learning through a digital practice should include targeting the educational needs of students. In order for this to happen teacher/educators require support understanding the pedagogical application to digital technologies.

Fullan & Langworthy (2014) deduce that pedagogy should underpin the integration of any teachers practice. As leaders, digital pedagogy would be characterised by “value added” learning; critical thinking, communication, creativity, collaboration, character building, and citizenship; and how technology can accelerate these. They further emphasise, technology can facilitate critical thinking and discussion, enhance collaboration and teamwork and be the innovative force we want it to be, but first, we must think about innovative pedagogy and the goals that are to be accomplished.

Therefore the study seeks to understand whether a DLF will support the pedagogical application of digital learning experiences and offer the guidance teachers seem to be seeking in terms of a digital practice.

1.10 Thesis Outline

This thesis is set out in five chapters.

Chapter One commences by locating the researcher and the focus on digital technology in practice; with regard to teachers of varying capabilities, and the support required to be transformative with digital learning experiences. This chapter then introduces why a Digital Learning Framework as a support system for planning and also sets out to define practice and pedagogy within a digital context. The aim and research questions are identified in this chapter. The research question, school description and the classroom setting for this study are also outlined in this chapter.
Chapter Two reviews the literature themes specific to digital technology and its apparent use in teaching and learning. Three literature themes are considered throughout this review:

1. Pressures on schools to use digital technology in teaching and learning, because of the investment in digital devices and resources.
2. The importance of professional learning development to enhance digital pedagogy and digital practice.
3. Implementing an innovative digital teaching practice.

Chapter Three examines Kaupapa Māori methodology and qualitative method used in this research. A full description of the two data collection methods: semi-structured interviews and focus group discussions will be discussed. The selection of school and participants will be outlined and finally, a review of the issues of validity and reliability, as well as ethical issues, will be addressed.

Chapter Four displays the findings from the semi-structured interview and focus group discussions of the school that participated in this research project. This chapter is in three sections:

1. The challenges of digital assimilation.
2. The value of a school-based Digital Learning Framework
3. Collegial Support.

Chapter Five discusses the key themes from the research findings of this study in relation to the literature review. The chapter will provide a conclusion of the implications of the research findings based on the three research questions, followed by recommendations for future practice, the limitations of this particular study and finally recommendations for future study.
2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter two reviews the literature themes specific to digital technology and its apparent use to transform teaching and learning in an educational setting. Three literature themes are considered throughout this review:

1. Pressures on schools to use digital technology in teaching and learning because of the investment in digital devices and resources.
2. The importance of professional learning development to enhance digital pedagogy and digital practice.
3. Implementing an innovative digital teaching practice.

2.2 Pressures on schools to use digital technology in teaching and learning because of the investment in digital devices and resources

Former Education Minister Nikki Kaye, (2017) announced an investment package of around $40 million over three years to enhance the digital fluency of our young people, however the amount of money poured into digital technology over the years has not made the impact that schools had wanted, some actually reporting that they were well underfunded in terms of achieving their technological school-wide goals for their learning communities (NZCER, 2015). Despite digital teaching methods becoming the preferred method in New Zealand schools, there is no evidence of a positive impact on our students. Effective practice that maintains coherence across teaching and learning programmes requires operative pedagogies (Education Review Office, 2018). The range of impact identified in international studies suggests that it is not whether technology is used (or not) which makes the difference, but how well the technology is used to support teaching and learning. The benefit of students being...
actively engaged is only an advantage for learning if the activity is effectively aligned with what is to be learned. It is therefore the pedagogy of the application of technology in the classroom which is important: the how rather than the what (Education Endowment Foundation, 2012).

Mark Wilson (2015) agrees that results look good in specific areas. Wilson acknowledges that devices motivate reluctant readers and some children benefit from online collaborative tools because of the instant feedback. Further to this Bolstad, Gilbert, McDowall, Bull, Boyd & Hipkins, (2012) found the collaboration between home and school enabled by devices has been shown to improve learning. However, Wilson (2015) debated whether devices rolled out at great expense, gave the perception that teachers could transform learning with the use of digital technology, when actually teachers were still trying to figure out how to develop digital resources into their practice. Dudding (2014) questioned the transparency of use if mobile devices were to be promoted as learning anytime and anywhere.

The roll out of world-leading communications infrastructure through the New Zealand governments Ultra-Fast Broadband (UFB) programme, Rural Broadband Initiative (RBI) and Mobile Black Spot Fund (MBSF) creates the impression that accessibility to the world is now faster and easier, because over two billion dollars in Crown funding has been allocated. This upgrade in technology is supposed to make mobile technology faster and improve connection where ever you are nationwide (Ministry of Innovation and Business, 2017a & 2017b) however ubiquitous use does not improve application of digital technology in teacher practice, it allows the access to be seamless Sharples, Taylor, and Vavoula (2005).

McKnight, O’Malley, Ruzic, Horsley, Franey & Bassett (2016) convey that there was a perception, that teaching and learning is transformative because digital technology is available anytime and anywhere. However, McKnight, et al., (2016) further point out the view that all teachers have a developed digital practice because of the availability of digital resources and tools anytime or anywhere, was in fact not the reality. Dr
Maggie Hartnett (2016) lectures in e-learning at Massey University's Institute of Education and has been working in the field of technology, she claims that the rapid growth of the internet and related technologies, has changed the way we interact with each other and surmises that the world around us is changing. This is particularly true for education where formal and informal online learning opportunities are shifting and changing what it means to learn. Technology enabled learning offers many benefits including the flexibility to fit learning and study around other life commitments. But alongside the freedom to decide when, where and how to learn there are also challenges. Motivation for students is one amongst a range of considerations that are crucial to online learner success. Digital technologies are often viewed as inherently motivating because they provide a number of qualities that foster motivation such as curiosity and novelty. Therefore the complexities of a digital practice as pointed out by Wilson (2015) expose some teachers knowledge practice utilising digital technologies as falling short.

Dudding (2014) acknowledged the work of Dr Maggie Hartnett and particularly so Hartnett’s belief in the potential for digital devices in the classroom as another iteration of digital technology pushed upon schools to use it. Dr Hartnett advocated for one to one device use as promising, but she accedes; it is still only as good as the teacher who is developing their pedagogy and practice to include digital technology. Howard & Mozejko (2015) described an example of digital technology use, within a traditional teaching paradigm as direct teaching instruction using an interactive whiteboard. Teachers may use an interactive whiteboard to teach, but they are often still ‘delivering’ content to students in much the same way as they did with an old blackboard. While teachers are able to write over and annotate texts and webpages, this is not fundamentally different to what was done in the past using overhead projector transparencies or photocopies. This example demonstrates that, in terms of pedagogy, teachers have for the most part integrated technologies into existing practices rather than changing their practice.
2.3 The importance of professional learning development to enhance digital pedagogy and digital practice

Kwakman (2003) conducted research into teachers’ participation in professional development and asserts that it is a teacher’s own responsibility to keep their practice up to date. The Ministry of Education (2008) asks teachers to identify an area of need in their practice and develop it by improving their pedagogical and content knowledge through Professional Learning Development (PLD), insisting effective practice requires teachers to inquire into the impact of their teaching on their students. Timperley, Wilson, Barrar & Fung (2007) surmised, on-going professional learning is needed to assist teachers to meet the ever-changing student demographic and knowledge base. Grosemans, Boon, Verclairen, Dochy, & Kyndt, (2014) acknowledged the speed of technological and societal changes and further challenges the knowledge and skills of professionals in changing and adaptive environments.

Howard & Mozejko (2015) researchers with the University of Wollongong who specialise in teachers’ integration of technology, argue that the expectation of digital technology use in the classroom should be clearly laid out by senior management and that the provision of appropriate technological and pedagogical support is key. Kentaro a researcher in the School of Information at the University of California, Berkeley, started the Technology for Emerging Markets research group. This group conducts interdisciplinary research to understand how the world’s poorer communities interact with electronic technology and to invent new ways for technology to support their socio-economic development. Toyama (2011) is of the opinion that technology use is never going to transform learning if the implementation in the classroom is ineffective.

Olsen & Sexton (2009) identified that teachers can become more constrained and less flexible when a change imperative is pushed without appropriate guidance and planning. A fundamental element of this support is providing teachers with the time to
learn about new tools, plan, collaborate and develop new curriculum. By providing support, and developing a shared vision of implementation, a collective positive belief about the value of digital technologies and change can be created.

**2.3.1 What is relevant to digital practice?**

Identified in the literature and relevant to the research project was the significance of pedagogical knowledge. Pedagogy involves understanding effective strategies for teaching a subject in ways that make it comprehensible (Fullan & Langworthy. 2014). In other words, the most effective uses of technology also requires a deep understanding of content and related educational strategies.

Levy- Feldman et al (2011) argue that teachers understand the need to “transcend the boundaries of the classroom” to make the frameworks of time and place more flexible to enable students to create learning continuities that are relevant to current educational concepts. Levy-Feldman, et al (2011) and Levy-Feldman et al (2012) frame this ubiquitous learning as consistent with the findings reported in the Technology in Education program authored by Wadmany & Kliachko (2014. p.30).

“Forty-five students in the program perceived the significance of a “digital teacher” as a person who has technological skills in teaching, independent, curious, flexible and open to changes, a facilitating teacher, student-focused, who enables independent learning but also encourages collaborative learning and is developing their practice continually.”

Fullan & Langworthy (2014) conclude pedagogical knowledge permits teachers to assess how resources fit with planned learning experiences. Furthermore teachers utilise online learning sites because a resource may lend itself to the learning focus or experience. However Lokesh (2013) wrote in his blog that a lot of technology use by teachers is born out of trying to engage students which can be seen as “playing” or
lacking depth, because teachers inadvertently resort to games, music, or playing online. He went on to say apps promoted by other teachers were used as a platform for collaboration or developing specific skills may or may not be useful. Lave & Wenger (1991) suggest, what suits one teacher may not suit another and pedagogical application may be different, one borne from inexperience and one steeped in experience. This is further explained by Bolstad & Buntting (2013) who articulate that the experience of a teacher who is developing learning because of their pedagogical expertise can transform and improve the learning encounter. The flipside is inexperienced teachers who are developing learning using digital technology, however, because pedagogy is still being learned, they purely focus on their strength, with apps and online resources.

In-depth research about teachers, by Day (1999), Hargreaves, Earl, Moore and Manning (2001) and Goodson (2003), has shown that the learning process is considerably more complex, particularly when the context and substance of teacher learning is itself changing. In addition, the literature indicates that “teacher learning requires time and commitment if substantial rather than surface changes in practice are to occur” (Kington, Sammons, Brown, Regan, Ko, & Buckler, 2014).

2.3.2 Digital Learning Support

Zhao & Frank, (2003) pointed out that teachers who are resistant to using digital technologies are more likely to adopt the values of their colleagues when developing their teaching practice. Howard & Mozejko (2015) realised, using technology to transform the educational experiences of learners’ means, “you can’t just turn up at the school gates with a truckload of gadgets and expect teachers to be au fait from the get-go.”
The adoption of a much more complex view of knowledge has been highlighted by Butler & Sellborn, (2002), Otero, Peressini, Meymaris, Ford, Garvin, Harlow, & Mears, (2005) as one that incorporates knowing, doing and being. In doing so, we need to rethink our ideas about what support is required to develop our digital practice. Ertmer & Ottenbreit-Leftwich (2010), Johnson, Adams, & Cummins, (2012), Otero et al (2005) identified some barriers to adopting technology-enhanced teaching as the time to learn the technology, technical competence with the tools, belief that technology may not be critical for learning, the reliability of the technology, and insufficient institutional support.

In a study exploring the factors affecting technology adoption, researchers, Keengwe, Kidd, and Kyei-Blankson (2009) reported that teachers were “more likely to use technology if they had management and peer support and cross-collaboration with other teachers using technology. Borko, Jacobs, and Koellner (2010) additionally suggest that effective PLD for teachers is situated in practice and addresses problems of practice; includes modelling of the instructional practices to be learned involving active teacher learning through collaboration.

A Digital Learning Framework as described by Irelands Department of Education and Skills (2018) would allow schools to apply a structure which would allow teachers to identify where they are on the journey towards embedding digital technologies in teaching, learning and assessment. McCombs & Vakili (2005) believe the human element is important to any framework, even if it is the most advanced technology-supported framework of learning. They recognise that one of the biggest factors to the success of digital technologies in learning, aside from the people involved, is the context of safety and support for learning that is established. Furthermore, that the biggest challenge is to design educational systems where technology serves to progress learners as individuals with diverse, cultural and educational backgrounds. The paradigm must value and support diverse learners and learning contexts anytime and anywhere.
The Digital Learning Framework should be viewed as an enabler of self-reflection and improvement and not as an inflexible checklist (Te Kete Ipurangi. 2018). Ambrose et al (2010) identify learning frameworks as research-informed models that help educators align learning goals with classroom activities, creating motivating and inclusive environments, and integrate assessment into learning.

2.4 Implementing an innovative digital teaching practice

Bolstad et al (2012), Clarke, Dede, & Dieterle (2008) & Li, Worch, Zhou & Aguiton (2015) have considered how schooling might evolve to better match the changes that have taken place in the 21st century. Bruce and Levin (2001) suggest that technology can be helpful in classroom settings by encouraging inquiry, helping communication, constructing teaching resources, and assisting students’ self-expression. Bransford, Brown, and Cocking (2000) refer to five very important roles that technology can play in education.
1. Bring world experiences into the classroom.
2. Provide scaffolding that allows learners to participate in complex cognitive tasks.
3. Increase opportunities to receive sophisticated and individualised feedback.
4. Build communities of interaction between teachers, students, parents and other interested groups.
5. Expand opportunities for teacher development.

2.4.1 Cognitive/Learning theories appropriate to digital learning

Piaget (1923) was the principal proponent of the cognitivist paradigm and advanced the theory that a learner gains knowledge and constructs meaning from the interaction between his or her own experiences and ideas. Its central tenet was that learning occurs as individual learners think and actively participate in what is happening. Piaget (1954; 1971) further argued that learners construct new knowledge from their experiences through two processes, which he called “assimilation” and
“accommodation”. Piaget (1981) strongly articulated that whatever gets into the mind of a learner has to be constructed by the learner through active knowledge discovery. Thus Piaget’s paradigm provided the foundation of what is popularly known as “active learning” as the best way to facilitate learning. Piaget’s theory provides the learner with more motivation and efficacy whereby students are confident in their ability to complete tasks.

Piaget’s “active learning” within the Flipped Classroom model (Bergmann and Sams. 2007) is described by Scretto (n.d) as ubiquitous learning where the learners become active knowledge producers, rather than knowledge consumers. Asserting further, that active knowledge making practices need to underpin the trending significance of innovation, creativity, and problem solving.

A fundamental proposition of child development theorist Lev Vygotsky (1929) in his social constructivism paradigm was that cognitive development is influenced most by interaction with people, especially in social environments. He wrote:

“In the process of development, the child not only masters the items of cultural experience but the habits and forms of cultural behaviour, termed, cultural methods of reasoning”. (Vygotsky, 1929, p. 415)

In what he called the ‘Zone of Proximal Development’ (ZPD), Vygotsky further explained that ZPD is the level of competence on a task in which a learner cannot yet master the task working by himself/herself but can complete the task successfully if given appropriate support by a more capable mentor.

The main difference between Piaget’s and Vygotsky’s paradigms is that learning is an individualistic experience with Piaget but a social occurrence in Vygotsky’s paradigm.
Vygotsky’s and Piaget’s theories lend each to the independence of learners, that when done well, a learner can seek help only when required, but if they have the tools and access to people that they can bounce ideas off, then their self-efficacy plays a significant role in how they approach learning and ultimately the level of difficulty of tasks (Bandura. 1997).

The Ministry of Education (2017) included a number of initiatives aimed at helping to upskill teachers and support a seamless shift of our education system to a digital environment, and provide more opportunities for young people to learn about digital technologies. The need for support for teachers and school leaders within a digital context will require what is effectively a paradigm shift in practice. Aubusson, Schuck & Burden, (2009) acknowledge teachers learn from each other and often seek help from their colleagues. They propose that the digital realm being circumnavigated offers collaboration with peers (online and during meetings) but also includes being able to work independently (classroom).

Bolstad et al (2012) observed teachers practice as influential on the future aspirations of their students in two ways. First, a “traditional” idea of knowledge as content, concepts and skills, from which the learner assimilates knowledge to demonstrate how well they have done in “subjects” or “learning areas” producing a limited scope for possibilities and future direction. They identified the second concept of knowledge as creating and using instant knowledge to solve problems and find solutions to challenges as they arise on a “just-in-time” basis (Bolstad et al., 2012). These ideas about knowledge have emerged in the world outside education, driven in part, largely part by economic, social and political changes, facilitated by digital technologies (Fox & O’Connor. 2015).
2.4.2 Teaching and Learning in the Digital Age

Mayes (2001) argued that before adopting any new educational technology, we should first clarify the pedagogical basis on which we wish to proceed. Mayes (2001) also argued that the emerging pedagogical consensus is around constructivism, meaning collaborative learning, authentic tasks, reflection and dialogue, and the promotion of identities and learning communities.

Lan (2014) sees the development of teacher practice in this “digital age” requires practitioners to transform their practice, their knowledge and their learning experiences; not just examine their beliefs about teaching. Teachers’ engagement with twenty first century tools, resources and skills are considered by Ahn (2011) to include; advocating and using the knowledge-rich universe of the internet and all the resources and apps available within. While Cox, Preston and Cox (1999) identified that without a clear and coherent sense of the pedagogical application and how it lifts or changes the learning, (what it is used for and how to proceed), teachers will be stuck without an understanding of how they can progress the learning. Consequently, in terms of this approach faddism, superficiality, confusion, failure to develop in practice, unwarranted and misdirected resistance and misunderstood amendments are highlighted (Fullan, 1991).

Research produced by Cox et al (1999), Fullan (1991), and Passey & Samways (1997) all maintain that teachers who resist change are not rejecting the need for change, but they are often the people who are expected to lead developments. Patton and Parker (2017) advocate for safe learning spaces where teachers are challenged through sharing experiences of practice in order to increase the knowledge and application of new pedagogy and keep up with advances in education. However the challenge can be overwhelming therefore teacher’s motivation and commitment can vary (Ketelaar, Koopman & Pj, Beijaard. 2014).
Critical to this issue is how digital technology is used by teachers. The lack of necessary training in the management of such change undermines long-term opportunities to make sense of new technologies for themselves. Which as pointed out by Cox et al (1999), Fullan (1991), and Passey & Samways (1997) can create barriers to both the learning and teaching processes.

Digital technology in the classroom can be misguided in that the focus is on the device and technical aspects of digital use according to Preville (n.d). Wilson (2015) identified the hit and miss aspect of digital practice if there is minimal training around pedagogy within a digital context. Both writers emphasised that technology does not replace the need for quality instruction and good teaching practices. Without good teaching practice, the technology can create shallow learning (e.g. levels of comprehension) and result in a deterioration of skills (Preville, n.d. & Wilson, 2015). Kvavik & Caruso, (2005) assert there are positive effects when used appropriately, however, if poorly managed or misunderstood, the use of technology can be detrimental in the teaching and learning process.

2.4.3 The significance of inclusiveness in teacher practice

Bolstad et al (2012) consider that, developing digital competency will assist all students to be present in the educational system and gain future equity in a society where digital competencies have become an everyday part of life in which students have access to online communities and economies without prejudice. However Māori academic Professor Mason Durie (1994. p.10) asserts “until the disparity in Māori achievement is corrected, Māori will continue to feature disproportionately in indicators of poor outcomes, and will be a wasted resource for New Zealand”. Durie (1994. P.10) further points out “as employment becomes less labour-intensive, and more dependent on the use of technology, fewer jobs will be available for those who lack functional literacy and numeracy. The larger the group, the more difficult it will be for New Zealand to create and sustain a high-performing, internationally competitive economy.”
Author and Professor for Māori education at the University of Waikato, Russell Bishop (2011) correlates failed pedagogy and discursive practice for Māori failure in mainstream education. Teacher practice and pedagogy is important to inclusive learning and progressing Māori in a digital education that assists future aspirations or at the very least advances 21st Century skills required for future employment. A blogger with the pen name billd (2017), reported digital skills were in the top three tertiary programmes wanted by Māori, Pasifika and Asian adult learners. Therefore teachers must adapt their practice and pedagogy to support digital inclusiveness.

Vital to realising the Ka Hikitia Accelerating Success 2013-2017, vision of Māori achieving and enjoying academic success as Māori (Ministry of Education, 2017a), is lifting the performance of the education system for these students. Especially because ninety percent (183,079 students) of Māori in primary and secondary education are in English-medium schools (Ministry of Education, 2019).

Realising the potential of every student, especially Māori who have a right to success “as Māori” is crucial to students accessing equitable, educational success according to Dr Ann Milne (2017). She further stated that white privilege which can be chameleon like in its appearance (disappears into the background but is still present) should not hinder the absolute right to critical, and culturally sustaining pedagogy that gives them the same educational sovereignty as Pākehā students (Milne, 2017). Manifested in the success of any education system according to Fox & O’Connor (2015) is the success of all individuals, including Māori in finding sustainable employment (Durie, 1994). The future employment prospects for most people will have technological, collaborative, creative, solutions-based and accountability components (Kearney, 2017).

Despite successive New Zealand political parties advocating for Māori success, it is still not realised throughout New Zealand. The New Zealand government want Māori students to stay in education longer in order to achieve the skills and qualifications, they need to reach their potential (Ministry of Education, 2013), however, the history
of colonisation in New Zealand, advances a moral imperative to better support and engage with Māori communities under the Treaty of Waitangi (Walker, 2001) to assure educational equity.

An excerpt in the New Zealand Curriculum (Te Kete Ipurangi, 2012) expresses how important the Treaty of Waitangi is and its place of importance as one of the eight principles used for decision making in lifting the achievement of Māori students as well as including the cultural values and language of Māori as a Treaty partner. The Treaty of Waitangi principle puts students at the centre of teaching and learning, asserting that they should experience a curriculum that engages and challenges them, is forward-looking and inclusive, and affirms New Zealand’s unique identity Bolton (2017) argues that New Zealand should be providing an education system that allows Māori students to succeed as Māori. Bolton (2017) further points out “ensuring Māori students enjoy and achieve educational success as Māori” is not defined by the Government or what the principles of the Treaty of Waitangi look like in teaching practice nationwide.

Educational disparities that afflict Māori are distinct.

“the overall academic achievement levels of Māori students are low; more leave school without any qualifications than do their non-Māori counterparts; their retention rate to age seventeen is far less than that for non-Māori; their rate of suspension from school is three to five times higher, depending on gender; they are overrepresented in special education programmes for behavioural issues; they enrol in preschool programmes in lower proportions than other groups; they tend to be overrepresented in low-stream education classes; they receive less academic feedback than do children of the majority culture; they are more likely than other students to be found in vocational curriculum streams; they leave school earlier, with fewer formal qualifications; and they enrol in tertiary education in lower proportions.” (Bishop, 2011. p.xii)
More recently, a briefing of Māori in education was presented to the incoming Labour Party Minister of Education which highlighted:

“The equity gaps in participation and achievement between Māori and non-Māori are persistent and significant. That is, there are over 10 percentage points difference between Māori and non-Māori across many whole of system measures and this generally increases at higher levels of education. Essentially, the suite of system measures shows us that efforts to address inequity is, at best, holding the problem but not resolving it.” (Ministry of Education, 2017c)

Therein lies the challenge. For teachers to engage learners where they are at and use digital technology to open pathways to further learning, teacher’s pedagogy has to be culturally specific to the learner and then enhanced with digital technology (Education Review Office, 2018. p.9).

2.5 Digital learning is not optional

Barkho (2016), Morris (2012), and Carr (2010) all believe that as this generation of teachers retire, that the “digital natives” (Marc Prensky. 2001) amongst us will take over and this will have significant changes for digital practice and pedagogy. Research by Li, et al., (2015) described a mismatch between digital generation teachers, teaching practice and their personal use of technology. The most significant difference was the challenge of connecting their personal, more social and mobile digital use of technology, to understanding the outcomes within the NZ curriculum as well as teaching and learning. While digital natives may seem to have an advantage, in that they were born into this age and have used digital technology all of their life, Marc Prensky (2001) believes, any teacher who is passionate about the learning will advocate for developing their practice in whatever area necessary.
Dudding (2014) referenced Brett O'Riley. He was the chair of a 14-strong reference group set up by former Associate Education Minister Nikki Kaye in the wake of a 2012 select committee inquiry into digital learning. He argued that:

“The move towards digital technology, is not optional. While we cling on to some of the past and some of the traditions, the rest of the world is moving. By the end of this decade, you won't be able to service a car unless you have computer skills. Yes, people can learn in different ways, but we live in a world with a lot of technology, so they become essential skills. All the same, people have every right to be sceptical because it's a big change”.

O'Reilly was further described by Dudding (2014) as agreeing, that not every school is going digital in the best possible way. Some have fallen into the trap of thinking that merely getting the digital devices into the classroom is enough. Others though, have successfully developed courses that make the most of the devices and have made sure their teachers get the training they need. Dudding (2014) surmised that, there was a big difference between a pilot project being implemented by the New Zealand government as a possible solution to digital assimilation and nationwide educational transformation. He further suggests that implementation needs to be very purposeful and carefully managed if it's going to work efficiently everywhere.

Professional development is widely researched however, teacher collaborative learning still lacks authenticated research evidence (Grosemans, et al., 2014; Guskey & Yoon, 2009; Patton & Parker, 2017). Highlighted in the research is how messy and complex teacher professional development can be; including relevance to practice, being responsive to teacher’s needs, limitations of time and evaluation methods (Patton, Parker, & Pratt, 2013; van den Bergh, Ros and Beijaard, 2015; Timperley et al., 2007). However, Cordingley, Bell, Rundell, and Evans, (2005) reasoned that, collaborative learning in professional learning development can allow for a flexible approach that provides teachers with a less rigid method of designing professional learning that is current, meaningful and can be directly applied to their teaching.
Timperley et al (2007) calls for a systemic response to the development of expertise, for the integration of theory and practice, for school and classroom-embedded research and development, and for on-going commitment to collaborative inquiry into the links between teaching and learning. Cordingley, et al (2005) found teacher-to-teacher collaboration through joint planning or collegial development beneficial to those involved, but also to the school wide initiative being implemented. Parr and Timperley (2010) concede that, in an educational setting there are multiple contexts available in which teacher professional learning can occur, Gregory & Kuzmich (2007) further propose new teaching and learning initiatives be given the time needed to become embedded in practice.
3. CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter will examine the two methodologies used in this research; Kaupapa Māori and Practitioner research which are both qualitative methods. This chapter will provide a full description of the two data collection methods: semi-structured interviews and focus group discussions used to gather data for this research project. They align with Kaupapa Māori and Practitioner Research because they are qualitative methods that interact personally with the participant; a key aspect of Kaupapa Māori methodology (Barnes, 2000. p.6). The selection of school and participants will be outlined and finally, a review of the issues of validity and reliability, as well as ethical issues, will be addressed.

The elements of this research design include:

- Digital Learning Framework
- Research methodology
- Research methods
- Selection of participants
- Data Collection
- Data Analysis
- Validity of Research
- Ethical Issues
3.2 Aim and Research Questions

The aim of this research is to conceptualise a Digital Learning Framework (DLF - appendix A) that may provide guidance within teaching and learning that supports the integration of digital technology into teacher practice.

The research was guided by these research questions.

1. How can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?
2. What will assist with determining how the DLF is making a positive difference to teacher’s digital practice will arise?
3. How will the DLF progress professional dialogue and guide decisions for teacher’s digital development?

Mason (2002) believes by using qualitative methodologies the analysis of data and the research methods used will add depth, multi-dimensionality, and complexity of the research as well as capture the nuance (subtle differences in body language or tone) and contexts of participants. These are all important factors to gaining a complete understanding of the stories from diverse perspectives (Barnes, 2000. p4)

3.3 Digital Learning Framework

As part of this study, digital frameworks already in use across New Zealand (E-Learning Planning Framework, n.d.), Australia (Australian Curriculum. n.d.), United Kingdom (White, S. 2017), Department of Education and Skills (2017) in Ireland and Wales (Welsh Government. 2016) were explored. Comparisons were made between each digital framework and then adapted to the content and contexts of the New Zealand curriculum and finally the participating school.


3.4 Practitioner Research

According to Terre Blanche and Durrheim (1999), the research process has three major dimensions: ontology, epistemology and methodology. According to Terre, et al., (1999) a research paradigm is a comprehensive system of interrelated practice and thinking that define the nature of inquiry along these three dimensions. The term paradigm originated from the Greek word paradeigma which means pattern and was defined by Kuhn (1997) as: research culture with a set of beliefs, values, and assumptions that a community of researchers has in common regarding the nature and conduct of research. Ontological and epistemological aspects are commonly referred to as a person's worldview. Two possible worldviews are: objectivist and constructivist. While both are not considered superior to the other, they each may be appropriate for some aspects of research or overly complex for other aspects (Guba and Lincoln, 1994:110).

Prior to progressing this research, a paradigm capable of conveying the aims of the research project had to be decided on. The role of professionally posited stories within a semi-formal environment led to an interpretive paradigm which Gephart, (1999) classified as knowledge and acts being interpreted by the researcher. The purpose of this study was to investigate the digital practice of a group of teachers to understand how they use digital technology within teaching and learning programmes. I carried out this research with the aim of first understanding the challenges teachers’ face integrating digital technology into their teaching and learning and from the interviews garner what assistance is needed to improve the DFL within this school population.

Robinson and Lai (2006) and the Ministry of Education (2009) consider teachers who inquire (with the view of improvement) into teacher practice as being, professional, self- regulated and work related. I am the researcher, and also a teacher who is inquiring into teacher practice with digital technology use. In completing this research, the aim was to improve my own practice within respectful professional discussions,
which would also benefit participants involved through research relevant to their practice and gaining value from the research findings.

My understanding of ontological and epistemological perspectives was identified by Mason (2002) as the nature (ontological) of the phenomena or social reality and what represents the knowledge or evidence (epistemological) of the phenomena or social reality. As the researcher I was to delve into the truths of participants with carefully worded questions and allow the answers to flow, change course and be altered by them. Personally and as a researcher practitioner, I value the social understandings, discussions, attitudes and motivations that lead to knowledge. The wholeness of a person’s story can be interpreted by their tone, their expressions and by what they are saying. My method for data gathering and analysis was closely aligned to my ontological and epistemological positioning as described by Bracken (2010) respectful engagement, non-intrusive, that allowed both participant and observer to work together in a relationship of trust and respect. As a Māori woman, my view of the world is more inclined towards social action, relationships and mana. This comes from the whanaungatanga experienced in a small rural community where Māori are related or as Keane (2017) describes, part of extended family (whangai) which are built upon respectful interactions.

Bishop (2011) reveals within a school context the mana of students and educators can be trampled on whether intentionally or unintentionally without a robust understanding of cultural values. Therefore he believes that research dominated by non-Māori does not lend itself to the ways of marginalised people, whether students or educators. Similarly Barnes (2000) describes the issue of who controls the research going beyond just understanding the study. Central to Kaupapa Māori methodology is the use, usefulness and ownership of the study.

Payne (2008) and Kincheloe (2012) pose that practitioner research is important to the understandings of colleagues by giving them a voice. Who best to offer insight into
teachers’ struggles, difficulties and then solutions? Coleman and Lumby (1999) and Kincheloe (2012) both agree a researcher who is also a practitioner, can enhance and add to their practice and knowledge while clarifying areas that will benefit all practitioners.

3.5 Qualitative Research

Mason (2002) explained how qualitative research was capable of producing very well-founded cross-contextual generalities. How things work in a particular context could be connected to explanations as well as gaining a clear picture of participants’ experiences. The strategic significance of context, and the development of understandings and explanations within less formal settings like social conversations, allow participants to be heard. Merriam & Tisdell (2015) point out, the rich data collected using the qualitative methods of semi-structured interviews and focus group discussions enables researchers to investigate the different experiences and perceptions that each participant has around the research aims and questions.

This research project used qualitative methods which align themselves to Kaupapa Māori methodology, because this framework is heavily reliant on oral traditions and values the narratives of its populations allowing the researcher to gain descriptive accounts of current digital practice (Bryman, 2012). It was important that participants’ evaluation of the DLF and their stories of practice were within a less formal setting, allowing their stories to flow without the researcher controlling the dialogue, tone or adding bias, which supported the use of a qualitative methods, which links well to a narrative driven methodology, such as Kaupapa Māori.

In summary qualitative methods were pertinent to gathering data within a framework which celebrates the voices of its participants, assisting with the collection of data and how it was interpreted.
3.6 Kaupapa Māori Methodology

The social constructivist and interpretive paradigm of this research is acknowledged as aligning to Kaupapa Māori methodology. This research project was small in scale with nine participants. Cohen, Manion & Morrison, (2007) surmised that subjective understandings should be based on the value teacher participants placed on the research. Therefore this research lent itself to an interpretive approach where the participants described their experiences. Bishop (2011) wrote the relationships formed between the researcher and participants positions the constructing of the storyline through “thinking as usual” discussions. Black (2006) saw this structure as being receptive to capturing meaning-making during interactions with their peers. This naturally open style of research makes meaning of real talk where participants become engaged in a collaborative process, the relationship builds and deepens as stories are shared (Bishop, 1999).

Kaupapa Māori Methodology can weave through the qualitative methods because both are seen as empowering to the stories and forms of expression of participants. Denzin & Lincoln (2005) captured Russell Bishop’s ideation of Kaupapa Māori Methodology as made up of many facets based on the principles and practice of Te ao Māori. Weaving Kaupapa Māori Methodology within a qualitative paradigm as part of this research project was not tokenism on the part of the researcher; it was lived, considered, and paid attention to, in order that the mana of both researcher and participants were intact at all times.

3.6.1 Aroha – Love and Respect

Respect was integral to the information collected and the professionalism of each teacher who contributed. Participants were able to read their transcripts and have an opportunity to change or add to what they had said on the transcript, keeping control
and ownership of their participation and where the corroborating of their stories is authentic. Leaving out the names of participants in shared experiences by coding their information was important to each interviewee feeling safe, while allowing their honest experiences of digital practice to be heard.

3.6.2 Whanaungatanga – Relationship, Family

The social and semi-informal aspect of a focus group was an opportunity for the researcher to build trusted relationships with participants through shared experiences and working together. Building professional as well as social relationships were appropriate to the participants knowing that shared experiences and rich accounts were for the benefit of all (kotahitanga - unity or oneness). Their shared stories allowed each teacher participant into the thinking of their peers and the understanding that each may have or is having the same challenges in their practice.

3.6.3 Manaakitanga

The process of hosting with kai to be at ease with each other first in order to share knowledge was an important aspect of showing appreciation. Being generous with gratitude and praise for input and their presence at each focus group meeting was important, especially as each participant’s time was precious. Supporting collaborative aspects of participants (allowing them to discuss and evaluate the DLF together without interrupting their train of thought) which let their knowledge and critique be authentic, timely and well thought out.

3.6.4 Mahaki

Generating respect by listening to the understandings of the participants as the focus group interviews developed which fostered trust between the participants, the researcher and the research project. Hudson and Ozanne (1988) and Neuman (2000)
saw it as essential to understand motives, meanings, reasons and other subjective experiences which are time and context bound, defined as situated within the context and time constraints of the research project. Hudson and Ozanne (1988) favour approaching this research from a paradigm of interpretivism allowing the unique experiences and perceptions of individuals participating in the research project to be accounted for and to evolve their information and values to progress the Digital Learning Framework (DLF) towards a framework that the participants believed would support their developing practice.

3.6.5 Mana

The knowledge, skills and pedagogy of each participant was important to this research project. I was humbled that they gave up their precious time to further not only this project, but also to try and add more to their own kete (basket). Acknowledgement of their teaching practice and professionalism was important. Especially recognising the effort, ideas and reflection they brought to the development of the DLF. Important to the mana of participants was to listen without interrupting and then asking questions in a way that was not offensive or personal but continued to encourage critique and discussion amongst participants.

3.6.6 Kia Tupato

Having the right people as support in areas that I was not confident in, especially Te ao Māori matters. My view of Kaupapa Māori Methodology changed through personal development of te reo and growing understanding of the principles and practice of tikanga within Te ao Māori. (Ruru, A. Personal communications, 2017 -2018). Kia Tupato is important to this in terms of what could be seen as disrespect from a Māori perspective. Valuing the place of karakia timatanga and whakamutunga, and
respecting the mana and matauranga of all participants is a must when conducting research with Māori populations (Hudson, Milne, Reynolds, Russell & Smith, 2010).

### 3.6.7 Titiro, whakarongo, kōrero

Ensuring the critique offered (especially in regards to the Digital Learning Framework (DLF)) was not overlooked showed participants that I respected their knowledge and opinions. It was essential that all teacher participant views were attended to and developed further so that they would be able to utilise the DLF fully. By responding to participants in a timely manner I was able to use their critique and professional opinions to further the DLF and my understanding of issues by asking relevant questions. Denzin and Lincoln (2005) wrote that using qualitative research methods allows the researcher to gain a rich account of current practices in the participants’ unique environment. Teacher participants belonged to different learning centres. This unique feature of the participating school used learning approaches based on curriculum areas that were determined by the community as engaging for students; Health & P.E, The Arts, Science, Technology and Inquiry. The different perspectives of support required were based on which learning approach teacher participants were specialising in and the value each participant placed on digital learning.

### 3.7 Sampling Selection - School

The selection of this particular school was coincidental to the schoolwide changes put in place by management to improve achievement outcomes for all students by investing Professional Development into teachers specialising in curriculum areas of strength. However, the changes the school was making was an opportunity to gauge the digital practice of teachers and the value of a support framework for digital learning. Their willingness to participate and the fact that schoolwide changes, recently
introduced had interrupted the daily systems of the entire school was an endorsement that the school wanted to add value to the practice of staff.

An initial approach was made to the participating school to gauge interest in this research. Follow up meetings and emails were exchanged regarding, stakeholders, the purpose of the research, expectations and ethics information. All appropriate forms provided, enabled the Principal to make an informed decision as to whether the school would participate in the research project.

### 3.7.1 Sampling Selection - Teachers

Recruitment of teacher participants was with an information letter delivered to all potential teachers with my contact details. The letter allowed respondents time to make contact if they had questions further to the information provided. It also allowed teachers to decide without feeling pressured by their peers or myself to take part in the research. I was able to give interested teachers who had contacted me through email or in person, the information they needed to make an informed decision. The priority for most of the teachers was whether it was time-consuming or needed a particular level of digital competency. My goal was to have a maximum of twelve teacher participants or a minimum of eight.

The research project was presented at an introductory meeting to inform volunteering participants of expectations and commitment required. Highlighted was that each participant would be involved in a semi-structured interview before the start of focus group meetings. Each focus group meeting would take at least 2 hours of their time every three weeks. The meeting would run as a group semi-structured interview, using questions that evaluate their use of the DLF.
There was a 25-year difference in the age range of all participants which would assist with teacher participants falling either side of Prensky’s (2001) term digital immigrants in research. The importance of the distinction is this: As Digital Immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree, their “accent”, that is their foot in the past. Teachers’ digital competency can be attributed to this distinction. How much value they place on what they already know versus what they are open to developing (p. 2).

The honest and authentic way I engaged with participants enabled interviewees to participate in an honest, open and professional manner. The researcher hoped to gauge whether the DLF would or would not, successfully support or guide teachers’ digital practice.

Of twenty classroom teachers at the participating school twelve participants, which is 60% of the teaching staff would offer enough rich data to develop the DLF as well as deem its usefulness no matter what level of digital competency teachers were at. The minimum number of teaching staff required would be eight which is 40%. This number would still give a range of ages and competencies which is essential because teachers either use the excuse that their age is a barrier to digital use or that they are not confident users of digital technology when they seek digital support or guidance. Nine teachers volunteered to participate in this research project. This amount of volunteers gave the researcher 45% of the teaching staff.

### 3.8 Research Methods

Semi-structured interviews and focus group discussions were the two qualitative research methods chosen as both of these data collection tools are consistent with social constructivist and interpretivist paradigms highlighted in the epistemological and methodological theories of this project. The use of these two data collection methods...
according to Morrison (2007) allowed the researcher to record experiences of participants concerning what was essential to their values and practice imperatives.

3.8.1 Interviews

One of the qualitative data collection methods chosen was semi-structured interviews. This process was appropriate to gain rich and relevant data to answer the research questions and which Coleman & Briggs (2007) assert, ascertain the participants' experiences of relevant professional learning development.

The semi-structured interview schedule consisted of 11 pre-determined questions (Appendix E). The questions in the schedule were used to highlight whether there was a need for a DLF. The questions in the schedule sought to uncover participants' challenges with PLD, including a reflection of their digital competence (within practice) and the focus of their classroom practice. This information would be helpful because of its relevance to the aims and guiding questions of this research.

Information that could potentially undervalue the professionalism or confidence of participants was handled sensitively, therefore, one to one interviews were appropriate to start the collection of data. According to Hinds (2000) interviews enable the researcher to clarify ideas or to ask participants to explain further. It was necessary to provide a safe environment where statements or opinions could be developed or clarified further. The research project did not seem to be unduly sensitive. However, participants were asked to share current digital practice in their school with the concern that information may not positively reflect the school.
All participants took part in one semi-structured interview which was necessary to gauge current digital practice, after the DLF was presented to participants to read (without explanations) prior to the start of Term four, 2017. By conducting semi-structured interviews with each participant, comprehensive data about the pressures teachers face when developing their practice could be collected. These discussions also gave insight into the challenges there are for teachers who rate themselves poorly in digital competency. The discussions also gave insight into perceptions of other teachers considered to be very competent with digital technology by their peers.

A week before conducting the interviews, the question schedule was emailed to participants so that they could reflect on their practice and to enrich their responses. Each interview was recorded electronically allowing me to participate in the interview process actively. Appropriate verbal and non-verbal communication was used during the interview, which according to Hinds (2000) ensured participants felt comfortable during the interview process.

Transcribing each interview after recording ensured that what was said was accurately recorded and not as Bryman (2012) asserts, the researchers' interpretation of what was said. The recording and transcription were appropriate to avoid bias and to increase the trust of this research project by all participating. Thanking the participants at the beginning and end of each interview was important to acknowledging their story and also ensured they felt appreciated.

The flexibility of each semi-structured interview ensured that the Kaupapa Māori methodology assisted the participants to feel safe, engage with the research and following Bryman’s (2012) example, were able to answer the research questions using the views of the participants. Depending on how the participants responded I adapted the interview schedule appropriately to elicit in-depth responses to the interview questions.

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Each interview started with a greeting to participants, stating the purpose of the research, thanking participants, and starting the interview with some general questions that gave participants an opportunity to speak about their experiences. The questions that followed were from the schedule and offered rich data to answer the research questions. The end of the interview allowed the participants an opportunity to return to any prior statements to add information or further clarify their understanding. Finally, participants were thanked for their time and the contribution that they made to the research.

### 3.8.2 Focus group discussions

Focus group discussions enabled the collection of in-depth, rich information where participants responded to the experiences and evaluations of each other. Each focus group meeting assisted with the development of the DLF and as Vogt, Gardner, & Haeffele, (2012) and Bell (2010) ascertain, helped answer the research questions proposed. It was appropriate to use focus group discussions in this research for the following reasons.

1. It was essential to know what people thought about their digital practice in a forum where they all had different levels of digital capability.
2. Like Hinds (2000) it was an opportunity to add to the understandings of other participants who were encouraged by sharing experiences.

The focus group discussions allowed flexibility, which made the Kaupapa Māori approach valuable to this research project. Participants were able to seek further clarification of questions from me, which Kitzinger (1994) viewed as important to the unique experiences of all participants. Hinds (2000) valued focus group discussions, because they could be used to seek more than one perspective. In this research project; Fully Certificated Classroom Teachers (separated into two categories; three to
five years’ experience and ten years or more experience) and Provisionally Certificated Classroom Teachers. The viewpoint of each group was invaluable to answering the research questions proposed and interpreting the data correctly.

The focus group discussion schedule consisted of eleven pre-determined questions (Appendix E). The focus group discussion schedule was carefully constructed to ensure that all research questions could be answered:

1. Can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?
2. What evidence will there be that the DLF can make a positive difference to teacher’s digital practice?
3. How will the DLF progress professional dialogue and guide decisions for teacher’s digital development?

Four focus group discussions were scheduled. However, one did not take place because of school priorities. Establishing email contact for communication and a shared Google drive for storing schedules and any other material required by the group occurred before focus group discussions took place.

Participants were selected purposefully based on their willingness to partake in the research and each participant demonstrated a keenness to develop their digital practice. Keeping the sample size to nine was advocated by Merriam & Tisdell (2015) who regarded a smaller sample size as maximising group dynamics, which Bryman (2012) and Hinds (2000) believe enhances the quality of participant responses. All participants agreed on focus group meeting times. One meeting took place before the start of Term 4. The focus group scheduled the next two meetings during the school term, with one more to complete the research and thank participants for their involvement. All participants engaged in the focus group discussion while some were conducting talks outside of the discussion forum that were relevant to the evaluation.
of the DLF. At one point, the Principal of the participating school sat in on the meeting, however this did not detract or hinder the responses of participants. During each focus group meeting, all participants contributed to the discussions taking place as part of the focus group evaluation or in response to an experience offered by a participant.

To ensure that all of the research questions were answered, careful consideration was given to the focus group discussion schedule. I wanted rich accounts of teachers’ digital practice and an evaluation of the DLF at each point in time. The scheduled questions were delivered via email to each participant, one week before the focus group meeting and then a hard copy (paper) was given at the meeting to remind participants of the questions that would guide the focus group discussions. The focus group discussions were conducted by guiding as opposed to just questioning this enabled ideas to be explored “in situ” with the help of participants (Kovach, 2010). As questions were asked, the participants explored their understanding of each question and added their opinions and thoughts. Kitzinger (1994) encouraged researchers to guide discussions by encouraging participants in their sharing.

The focus group discussion schedule was similar to the semi-structured interview. Each focus group meeting started by greeting the participants, stating the purpose of the research, thanking participants, and establishing a discussion forum with some general questions that gave participants an opportunity to speak about their experiences. The questions that followed were used from the schedule as a guide to elicit responses by both the researcher and participants gathering rich data that would answer the research questions and further determine the value of the DLF to teachers with a range of competencies using digital technology for teaching and learning. The end of the focus group interview allowed the participants an opportunity to return to any prior statements to add information or clarify their understanding. Finally, for their time and contributions to the research, participants were thanked.

Kaupapa Māori methodology was crucial during the focus group discussion sessions. This approach aligns with the researcher's cultural perspective that everyone's journey
is unique to them. Aroha, titiro, whakarongo and kōrero; participants were respected for the information being shared and experiences of digital practice were valued by listening attentively. Whanaungatanga and Manaakitanga; the shared accounts gave participants' insight into possible avenues of digital practice as well as establishing relationships of trust and respect. The collaboration of shared knowledge was authentic and factual, laughs and informal banter were deemed part and parcel of the talk as relationships developed between participants and myself. Mahaki and Mana; The evaluation of the DLF by all participants evolved the DLF into a working document that was accessible to all participants and valuable to initiating points of reference for each level of digital competency. The knowledge and experience of participants’ added value to what I was trying to achieve with the DLF.

Throughout the three focus group discussions attended, participants displayed a high level of professionalism, which allowed all participants to express their viewpoints freely. Verbal and non-verbal cues were used to ensure that all participants felt valued and were able to contribute to the focus group discussions. An electronic recording of one focus group discussion was transcribed as recommended by Bryman (2012) so that the session data was accurate. With the second and third focus group meetings, notes were taken of references to the DLF where a lot of the discussions centred on ways to use digital resources and tools from the DLF as examples of use.

3.9 Data analysis

Data analysis as described by Lofland et al (2006) was the process of taking raw data and turning it into findings which was completed after semi-structured interviews and focus group discussions had concluded. The data collection method chosen presented unique challenges when analysing and presenting the results. It was therefore essential that when the analysis and presentation of findings was completed, it was done in a valid and rigorous way to reduce bias. At the completion of each focus group discussion and semi-structured interview, the transcription and additional notes were completed on time as reinforced by Hinds (2000) so that the essence of these sessions
was not lost. However, researchers Cohen, Manion & Morrison (2011) affirm an analysis of all the data was commensurate with all raw data being collected from all participants so that the first impressions of the raw data did not influence any of the data collection still to be completed. For this reason, analysis of data did not commence until all data had been collected and then transcribed.

Once all transcriptions were available, I went through the interview data and then with the focus group data. I used one coding method as encouraged by Lofland et al (2006). Using sentence and paragraphs as first level analysis the data was explored for similar themes, identifying sub-themes in the data. Themes were defined in a small number of general codes or "tracks", shifting the analysis to broader, emerging themes that were directly related to my aim, relevance to the research questions as well as the interview and focus group evaluation of the Digital Learning Framework. Wilkinson (2000) wrote that numerous categories can emerge from initial coding, which was true however, these were narrowed by identifying similar themes and absorbing the many into a few broader categories. For example, the primary categories related to, barriers to digital technology use, which were: inconsistent use of technology, needs based, access to PLD, priorities of learning, and collegial knowledge. Several of these initial categories were then combined to give the final categories: The challenges of digital assimilation, the value of a school-based Digital Learning Framework and collegial support.

The interview questions were placed together in an excel document in order of specific sub-themes. For example, the sub-theme ‘barriers to digital technology use’ responses from interview questions 2, 4, 5, 7, 8, and 10 were added to this document after coding. Three excel documents were set up, one for each of the major themes: The challenges of digital assimilation, the value of a school-based Digital Learning Framework and collegial support.

Each sub-theme was allocated an individual sheet in the excel document. For example, the theme ‘barriers to implementing digital technology’ had two sub-themes ‘value placed on digital practice’ and ‘planned digital learning experiences’. Each document was secured with a password as the participants’ of this research, and full
transcripts of each participant’s interview data were added. The transcripts were used to process the data from the semi-structured interviews as well as the data from the focus group discussions. Once coding was completed Lofland et al (2006) confirms, researchers should start the first draft of the analysis.

The data in this research project was organised by challenges that arose through the data and then by how participants were coded. Cohen et al (2011) specifies, classifying the data from the semi-structured interviews and focus groups into separate sub-themes and themes allowed for all the specific data to be drawn together, keeping the data whole and cohesive. Patterns, relationships and comparisons across all participants were then able to be presented. Organising the answers of participants using Google forms gave a statistical result for certain questions. For example questions 4 and 4b (digital competency self-evaluation before and after; appendix G), and question 7 (digital learning support offered; appendix G) were organised into graphs which gave a quick view of their answers and statistical information of each question.

I coded the participating teachers into three cohorts based on their years of experience in teaching. Participant Teachers who were Provisionally Certificated started with PT and then numbered for the number of participants. Participants who had three to five years’ experience were coded TF (Three - Five), and the end numbers continued from Provisionally Certificated Teachers. The next participants were either side of fifteen years' experience, so I coded them TP (Ten Plus), their end number continuing on from the Three to Five group. These were the codes assigned to each teacher: PT01, PT02, PT03, PT04, TF05, TF06, TF07, TP08 and TP09.

Within these cohorts, patterns emerged that were quite telling to all of the themes and sub-themes identified in the data. The spread of experience, the impact of workload and the significant difference in each cohorts digital practice, encouraged a different theme with which to present the data.

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3.10 Validity

Throughout this research project the research design, methodology and conclusions were what Bush (2007) regarded, as adding to validity and ensuring that the research accurately described the experience that it intended to. Cohen et al. (2007) suggests that it is impossible for any study to be one hundred percent valid and therefore the best we can do is to maximise the validity of the research design.

This research was reflexive in manner because of research inexperience which was evident when school priorities interrupted the time assigned to meet the focus group. It also compromised the time spent on evaluating the DLF, to spend more time on digital practice in the context of each participants learning centre.

According to Cohen et al (2007) several factors at the design phase of this research project needed to be considered to maximise validity. The data collection methods chosen allowed specific answers to be collected appropriate to the research questions and aims. Obtaining data from nine participants of varying teaching experience and ages ensured a variety of responses. Data collection occurred over a period of two months, unfortunately, because it was the last term of the school year and participants had many priorities and pressures common to that time of the year some of the discussion points were incomplete. This did not detract from the overall research or the themes and sub-themes identified.

The semi-structured nature used for both the interviews and focus groups also increased the validity as Cohen et al (2007) suggests, participants who all face the same questions maximise efficacy by using a range of participants' perspectives. Further improving validity in the data analysis phase was using a consistent and systematic way of coding the data.
The analysis of the interviews and focus groups took place at the completion of data collection of all participants. Delaying analysis until all data had been collected minimised subjective interpretations of the data or using particular parts of the data. The integrity of the data was paramount when trying to maximise validity; therefore whenever possible, participant's voice was used rather than paraphrasing. The decision to paraphrase was intended to reduce the risk of the researcher's view coming through too strongly in the analysis.

This research project has focused on one small group, however, the fact that rich accounts of participants experiences and honest evaluations, based on participants perspectives, gives the researcher confidence of the validity and credibility of this research.

Although the findings of this research are unique to the participating school, some of the experiences shared can be transferred to many other contexts. Acknowledging that the researcher’s bias towards digital technology and its place in education could taint the research, it was necessary to allow the data to speak for itself as much as possible. The transcription of the semi-structured interviews and focus group increased the authenticity of this research project enabling participant voice to be accurate in the analysis of data.

The selection of the participants in this research was voluntary. The sample of participants enhanced the credibility of this research because of their different experiences with digital technology. Their digital capabilities did not bias them one way or the other. A number of the participants at the school used in this study were known to the researcher.
3.11 Ethical issues

I state my position as an insider practitioner-researcher so whoever reads this will understand that it is my intention to be open and transparent. I have stayed within the guidelines of my ethical responsibilities, including impartiality of thought and action during the collection of each participant's narrative and interview data. In order to show objectivity I tried to provide as much detail and transparency as possible to the process behind the research, findings and subsequent analysis. I did flick between being a teacher practitioner and the researcher of this project throughout this journey which reveals the difficulty with making the research process as seamless as possible.

The nine chosen participants were asked to consent to this research before the research took place. Information about the research aim was sent to the participants before any data collection occurred. The researcher met with the participating schools Principal before any data collection happened. The school used in this research will remain anonymous, although because of the location of this research the school assumes that anonymity is not likely to remain in place.

Participants in the school will also remain anonymous. Each participating teacher was not pressured to participate in this research project. Assurances that participants had the right to opt out of the research project at any stage without prejudice were important. Schools and individuals were given a research Information Sheet (Appendix B) before data collection. Bryman (2012) determined that information should be provided to make an informed decision as to whether or not participation is merited. Participants in focus groups and interviews were asked to give informed written consent (see Appendix C) by signing a consent form before they participated in the research. Participant teachers had a hard copy of information about the research aims and a meeting schedule, a week before the first interviews. It was important that all participants knew what they agreed to and were aware as Kaler & Beres (2010) puts it, what were the benefits and burdens related to being part of this research project.
The researcher informed the participating school and teachers that this research was on “The value of a school based Digital Learning Framework: Does it offer the support and guidance needed for teachers of varying digital capabilities?” The understanding between the researcher and the participants is that this research, the completed Thesis, as part of the requirements for the degree of Master of Applied Practice, will be presented to the school and Board of Trustees.

When planning the research design, some ethical concerns were at the forefront of the researcher’s thinking. Areas of concern were harm, whether the participating school or teachers were perceived negatively. Bryman (2012) and Kaler & Beres (2010) identify informed consent as crucial to research. Consent ensures that each participant understands what they were volunteering for and that although they were anonymous, identification of the participating school within their community was a likelihood. Invasion of privacy and deception, ensuring that interview and focus group questions were pertinent to the project aims and research question.

The researcher believed that assisting teachers, with a support framework, would benefit and develop the digital practice of teachers in the participating school. The researcher sought to ensure the relevance of digital technology use in an educational context and the opportunity to develop digital practice.
4 CHAPTER FOUR: FINDINGS

4.1 Introduction

This chapter displays the findings from the semi-structured interview and focus group discussions of the school that participated in this research project. This chapter is in three sections:

1. The challenges of digital assimilation.
2. The value of a school-based Digital Learning Framework
3. Collegial Support.

In each of these sections, the findings will be presented from the transcripts of participating teachers. The participants were grouped according to their years of teaching experience to determine the correlation between experience and perspective, thus adding to the data. Each participant had an individual opinion and understanding of the support they received in planning digital learning experiences as well as the value placed on the adapted Digital Learning Framework as a support system for assimilating digital pedagogy into their practice.

4.2 Research Questions

The project was guided by the following research questions:

1. Can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?
2. What evidence will there be that the DLF makes a positive difference to teacher’s digital practice?

3. How will the DLF progress professional dialogue and decisions for teacher’s digital development?

4.3 Background to the Research Project

This research project aimed to provide teachers with support in the form of a Digital Learning Framework (DLF) and to uncover how digital technologies are being used and what kinds of support they were already receiving. One semi-structured interview was conducted with each of the nine participating teachers at the start of the research project in order to first hear their stories. Three focus group interviews were completed from the four that were scheduled.

4.4 Coding Participants

In order to provide anonymity to each participant and to see the spread of experience, I coded the participating teachers into three cohorts based on their years of experience in teaching. The reason I coded them according to this spread of experience was also to identify whether an overall picture of how teachers with varying teaching experience establish or apply digital learning experiences emerge. I also wondered whether their issues or competencies were similar or stem from different challenges.

Participant Teachers who were Provisionally Certificated started with PT and then numbered for the number of participants. Participants who had three to five years’ experience were coded TF (Three Five), and the end numbers continued from Provisionally Certificated Teachers. The next participants were both sides of fifteen years’ experience, so I coded them TP (Ten Plus), and their end number continued from the Three to Five group. These were the codes assigned to each teacher: PT01,
PT02, PT03, PT04, TF05, TF06, TF07, TP08 and TP09. There was a total of nine participants in this study.

4.5 The challenges of digital assimilation.

To varying degrees participants were able to articulate what they needed regarding the implementation of digital technology into their teaching and learning. They acknowledged that several factors influenced their decision making about implementing digital resources and developing their digital practice. Identified as key to the challenges faced by participants are these three findings.

1. Location
2. Competing priorities
3. Lack of expertise and direction through PLD

The participating teachers were able to describe and comment on the PLD they have had and sought to have. The participants all reported that the DLF would be key to ensuring that digital technology was implemented well but would still require varying degrees of support. The interviews conducted for this research project acquired a lot of rich data from participants.

4.5.1 The challenge of PLD (Location and access)

The most significant factor that all teachers but one highlighted as detrimental to their digital experiences was the lack of Professional Learning Development (PLD). Eighty-nine percent of participants had no PLD in digital technology at all in 2017. One of the teachers could not remember if they had or had not been part of digital PLD in the 2017 year. Most teachers thought they had, but when pressed realised they hadn’t.
I don't think I have... (had any)... I don't think so not that I can remember (TF06)

The location of PLD and not understanding how to access PLD based in Main Centres were two critical challenges to professional learning support. The inconsistent use of digital tools and resources school-wide demonstrated a lack of expertise to challenge the direction and implementation of digital use. The deliberate use of technology went only as far as the most competent user.

4.5.2 The challenge of competing priorities

Competing priorities was one of the reasons participants did not investigate digital technology use further and also why they couldn’t identify where and in what way they needed help. There was no firm direction concerning expectations for using digital tools and resources in learning. Asked what kind of digital technology PLD participants had taken part in or research they had completed to develop this area of their practice, participants responded in similar ways. Mostly that they felt time poor and did not want to add to what they were already managing, therefore, they just wanted someone to tell them what to do.

“No, not yet - basically a case of I don’t know what I don’t know.” (PT03)

“No I haven’t taken the time to do it just cos (sic) it was my first year, and I was always flustered with other stuff.” (PT01)
Participants were managing system changes schoolwide as well as school-based PLD in school-wide focus learning areas. Mentoring meetings, staff and syndicate meetings, continuous reflections and updating teaching journals were priorities in their week. Learning effective pedagogies for core learning areas was also a learning priority for them. Participants focus on developing pedagogical knowledge in learning areas they were teaching every day, seemed to under value the digital tools they were utilising in their classrooms. One participant saw it as on a need to know basis.

“unless it's provided for me at this stage it's non-existent really, unless like something is given to me that I need to practice up on or study up on, then otherwise unless I come across something in a lesson, or a question is being asked then I'll have to look up how to do it” (PT03)

4.5.3 The challenge of expertise and direction

Factors that influenced these participants use of digital tools was the lack of direction and available PLD specific to digital technology. A third of participants acknowledged that digital technology was not a priority for their practice and that although they had devices in the classroom, their students knew more than them.

“… my students, so some of them have more digital experience than I do…” (PT04)

“I think it’s a waste a time me having them if I don’t know how to use them properly the kids know how to use them more than me.” (PT02)

The demands of the working week and some weekends were revealed by one of the participants as a reason for prioritising focus areas of development.

“... I don’t go and look for it… I’m always busy, so I stick to what I’m told to do.” (PT01)
Participants who had been teaching three or more years could identify areas where digital technology could be better utilised but felt they lacked time because of other priorities. Therefore, they were more inclined not to seek PLD. These teachers were autodidactic, finding digital resources in a just in time manner. Their investigation usually stemmed from an interest in changing up the learning to engage their students or because they had researched specific themes and the research uncovered a new app or resource that could be featured in the learning experience.

Participants discussed how teacher’s engagement in teaching and learning was enhanced by the many digital tools, resources and apps that assist with teaching processes or strategies of concepts in a myriad of ways. An example of the intrinsic influence of digital teaching, as highlighted by Blundell, Lee & Nykvist (2016), is shown in the following responses to the question; how do you manage your own professional growth in digital technology? While these teachers are using digital tools to engage students or enhance their lessons it is task based and substitutes for traditional teaching approaches.

“I was sick of doing just your typical brainstorm… then I found padlet and those sort of things.” (TF07)

“There’s new stuff, so I have a squiz at the stuff that tweaks my interest, and I just research.” (TF05)

“… so if I’m bored with the way this sort of thing is working or whatever I try to find an alternative to it, so I’ll just research. (TF07)

One participant described the importance of developing appropriate pedagogy so that students and teachers could make the most of the technology available to them. The same participant described how finding enough devices during a teaching session was
a challenge and because digital technology was such a focus in this participants classroom felt learning with digital tools was not such a priority for others.

“Ummm… it’s a bit annoying when I have to try and find Chromebooks to use in my class and what I see (in other classes) are students listening to music or not using them for learning really and then I am told (by teachers) we are using ours… (pause) I’m thinking not very well…” (TF05)

A concern based on access to PLD was the reliance on collegial support in place of PLD and with that came the challenge of lack of expertise, time and wider knowledge. A key finding relevant to this project was that teachers were developing digital capabilities through the expertise and troubleshooting efforts of their colleagues. This resulted in a narrow view of what digital learning looked like and was specific to the tools and resources used by the teachers who shared. Adding depth and value to digital technology in other forums, ways and within planning can be missed as teachers can only go as far as their knowledge and expertise. When Focus Group question 2 was asked; Explain how equipped you were to handle the challenges of connecting digital resources to learning by having the DLF to support and guide you? (Question was altered to accommodate the flow of this discussion)

“Connecting learning to digital resources - huh who? Say it again. Uuuuuuhhhhm…no.” (TP09)

“I want to use it to its potential but not so it becomes more of a burden than it should be do you know what I mean.” (TP09)

“Well, whatever support can come my way because with me if I need digital learning well, I will do it, but if I don’t need to well I won’t.” (TP08)
There was a desire by participants to use digital tools and resources more than they were able to presently. However, they were unwilling to give more time to develop outside of formal meetings or PLD, with some teacher’s lacking engagement during the discussions around digital technology. Once the meeting discussion had been processed they realised the support offered through the questions, statements and opinions of their colleagues unpacked and explained the DLF.

4.6 The value of a school-based Digital Learning Framework

The DLF used in this study needed to be relevant to the school participating in the project and easy enough for teachers with a range of digital capabilities to use in planning. This was essential as part of the problem for some of the participant teachers stemmed from; how to develop relevant lessons that would transform learning using digital technology. A number of the teacher participants cited that it was difficult to integrate online resources when they had little or no knowledge of what these resources might offer. They suggested that if there was a bank of resources with links and an informative summary of what each did then that would assist them with moving into planned digital learning experiences.

Some teachers were keen for the DLF to assist with the transformation of their digital practice. The value of the DLF was seen by most teachers (after being adapted further) as a learning bank which could be added to as well as holding other teachers, planning, learning sites and learning apps. Further still, where teachers could change or add these digital resources, planning and comments as and when needed.

Some of the participating teachers wondered whether it was possible to add tutorials, which would cut down on the limited time they had available which was often used to research or find out how a resource or app worked and how to manage or mitigate issues.
4.6.1 DLF - first thoughts

Participants’ first thoughts about the Digital Learning Framework was that it was too long. The length of the document that would frame digital learning for their practice was a barrier to two thirds of participating teachers.

“… takes me ages to find because I have to you know, read everything…” (PT02)

“… umm so did we have to read it all? It seemed pretty long. I didn’t really get time to read it.” (PT04)

The barrier experienced by the majority of participants to reading the DLF in its draft form spoke volumes about how due to workload, especially with a new learning system being engaged, teachers time was precious, thus highlighting the need for any professional readings to be bite-sized. The DLF was given to them in its draft form to read over the Term three holidays and the extra time of the holidays still did not inspire most of the participants to spend time reading it.

The feedback provided in the first focus group meeting outlined the difficulty experienced in reading the DLF and that it needed to be adapted to be succinct and user-friendly. The length of the document created the first opportunity to adapt the DLF to be user-friendly. Each area was tabbed into a Google sheet, which made the adapted DLF not so long and enabled teacher participants to go straight to a specific element without having to scroll through a long document.

The length of the first draft was a barrier to the DLF being widely read among the participants. Time was a huge factor for all participants which setback the first focus group meeting discussion, with some of the time set in the meeting for participants to
read it. Three of the participants had read the DLF prior to the first focus group meeting.

“Oh that’s way better … I don’t like reading, you know long as stuff.” (PT02)

“So you’ve split it (like I asked in the beginning) and you’ve got the steps or intentions after it, you’ve got the tasks under each one it aligns with each one and it makes it easy, a lot easier to follow.” (PT04)

“Yeah, I didn’t read it, I looked at the wrong things, what is it called, you know the drive or something.” (TP08)

The comment by TP08 was prior to the focus group meeting. TP08 later found that the DLF once updated was easier to follow, giving teachers support with digital skills.

One of the participants was concerned that they would have to plan two different lessons for one teaching concept and another participant could not answer the question but tried their best to answer in the affirmative.

Q11. Do you think the DLF will be a useful guide for other teachers?
“Yes if we don’t have to double up.” (TP08)

“Uhhhh this is the new initiative thing? Oh... well, I need to look at it really you know to give it any serious answer cos (sic) I couldn’t really see it that well.” (TP09)

TP09’s answer in this instance was prior to the Focus Group discussions. TP08 and TP09’s responses show that although teachers were positive in the research project and towards improving their digital practice, they needed time to process how the DLF
would work and PLD in a formal setting to capture the time. The accountability of time within each participants responses were predominantly prioritised according to senior management school-wide priorities.

4.6.2 DLF - a focus on digital practice

Participants identified that their digital practice needed work and that they wanted to ensure that the technology available to students and teachers was used in a way that enhanced teaching and learning. Discussions focused mainly on captivating learners, increasing student engagement and making learning fun. At least forty-four percent of participants invested their time and energy ensuring that the digital technology they used was implemented successfully. For example, one participant (TF05) engaged in a collaborative enterprise to develop an interest in reading with Skype calls to students from another school outside of the region. The participant noticed an elevated interest in reading during this period.

The need to invest in staff development to make the most of the available technology was an underlying cause for concern with some teachers but not others. Only one of the participants felt that an important next step was to increase collaboration amongst staff with the development of digital technology. Another participant had researched digital implementation, not with any depth but out of interest and touched on pedagogical change and felt excited about the support offered in the DLF.

“… It’s going to have the framework to help us and then we’ll be like, oh right this can go on from that … and we can develop our ideas with a base instead of always trying to reinvent the wheel. ‘(TF06)
“I like that it’s now easy to follow.” (TF07)

4.6.3 DLF - The content

The participants also thought more about the content in the DLF. They liked the idea of descriptors or intentions that gave them a starting point for learning and progressions within the same area which could add depth to their students learning. While these participants thought about what it might look like they did not have the time to delve into it further. They were excited to have some ideas about what learning experiences connected with the descriptors, digital tools and resources and also that there was a tab that gave some tutorials and ideas about apps that had been used by other teachers successfully.

“What I like are the progressions of learning… I use to wonder what the next step would be… you know, how could I make this more advanced …” (TF07)

“The learning intentions are small, easy to understand, not too massive, which is good cos (sic) we want to teach this stuff, you don’t want to have a whole big amount that you’re trying to teach and you’ll be like what?” (TF06)

“There are ideas in here that I never really thought of, you know… like I kind of assume my kids know it, but obviously, it is something we need to be very explicit on and teach our kids.” (TF06)

TF06’s response to the usefulness of the learning ideas and experiences (which are within progressions) does demonstrate that sometimes we teachers assume kids will just catch on to what we are teaching. TF06 also unwittingly reviewed the DLF
positively as a way of knowing whether students are capturing learning in the right context and in a digital context or whether we are just moving on regardless.

4.6.4 DLF - varying capabilities

During interviews, two participants spoke about some teachers needing more support than others to understand how the DLF could support and guide their digital practice.

“This will obviously benefit us, but some might need extra help.” (TF06)

“… probably don’t seek out the ability to do so themselves… I suppose being able to drive it… could definitely provide support for them though.” (TF07)

Participants were identifying that colleagues who for multiple reasons find it difficult to lift their digital practice. The participants are being quite polite and are not being overt with any reasons why some may need more support.

Acknowledging the different digital capabilities also made apparent that some teachers are more likely to make use of the DLF no matter what support is in place.

“You can incorporate it into your lesson. I need to thoroughly look at it. You know I can see it. I can see it in my whole class. I’m doing up new plans for my whole class... but I have to know it inside out before I put it in my planning… but yeah, now looking at it… lesson 1 (pointing at a learning intention in the DLF) lesson 2.” (TP08)
4.6.5 Key Findings - the value of a school based DLF

All participants were positive during discussions about the DLF.

The value of the DLF as seen by all participants was that it gave them a starting place and an example of what digital implementation looks like. Participants also liked that there were intentions that were not huge but bite-sized and also that there was examples of tasks to complement the intention (as an example).

The DLF was set out to get teachers started straight away but allowed them the freedom to adapt it for their class and level of expertise. Some participants welcomed the fact that the DLF showed progressions enabling them to add depth and develop pathways of learning. Some participants still required support while others felt it offered their teaching practice the lift they needed to use digital tools and resources better.

4.7 Collegial Support.

During focus group discussions all participants described the importance of using technology in such a way that it enhances teaching and learning. However, their interview descriptions identified their own technology use as mostly incidental, or as a tool much like using books and pens.

All participants had some working knowledge of Google apps and felt the most equipped to implement this suite of learning apps into their classroom teaching and learning programmes. Most of the participants had help getting to know how to use Google apps and described the PLD received as being in-school.
There were teachers who could be classified as experts which is not in any way a negative. All teachers in one way or another offered limited or developed expertise to their colleagues. The fact that it was not noticeable or identified as planned learning support helped it stay under the radar. Not many teachers knew how much or how little help each was getting from others but it was mostly from colleagues in their learning centres, learning teams or a general knowledge of who would be best. The PLD support that participants had access to indicate quite strongly that location has a significant impact on teachers' progress with digital technology use. Collegial support was found to be positive and was identified as such in most of the interview scripts. The development of participant's digital practice can be attributed in large to their colleagues who they shared discussions with, and asked questions of while trying to broaden their understanding of how best to implement digital devices.

“… was good because you get to see what other teachers have experienced so that support was, is good.” (PT01)

Each of the participants felt they stepped up when needed. The findings bear this out with all participants in one way or another describing a time where they assisted a colleague in a digital matter. Forty-four percent of participants laughed at the fact that they had tried to assist a colleague with digital technology. This was because they did not feel they had the capabilities to help others. Another forty-four percent of participants agree that supporting colleagues was both a daily or weekly occurrence and the last twelve percent felt on a par with other teachers in their syndicate therefore only added to discussions during meetings.

“… so whenever she has trouble especially with Google, uploading any evidence that she has she will usually come and see me about uploading that.” (PT03)
“...but then we like laugh at each other cos we don't know much... the blind leading the blind (laughs).” (PT02)

“So far this year two people have come to me and that’s the older teachers. I didn't know how to do it, I can't remember what she asked me to do, but I had a try anyway, and I ended up helping her.
So were you just tutu’ing?
Yeah, I was just tutu’ing but if I don’t know anything I will just go to …” (PT01)

The importance of collegial support cannot be underestimated. Participants agreed that seeking help from colleagues was invaluable to not only finding the right information but also developing better understandings.

“...it’s only through literacy when we have our meetings the girls might show us another app... “(PT02)

“We did one using Prezi so that has been shown to me from another teacher.” (PT03)

This research project found that most participants were able to identify areas where they were developing their digital practice independent of anyone else. While they may not have placed any importance on this, it shows that they were autodidacts when there was an area of need in their practice. Some more so than others but it was evident in the interviews.

“... how to use it in you know meaningful ways is the trick isn’t it, so it’s not just for entertainment, it’s not just keeping them quiet. You’re actually using it to improve teaching and learning.” (TP09)
4.7.1 A focus on apps

Developing understandings through colleagues is a two-edged sword when it comes to digital practice. Colleagues can and will try to assist digital understanding and progress classroom practice. There can be instances when the focus is too much on the resource/app and leaves the pedagogy (the guts) out of the process.

“Yep so… in google classroom we have learning intentions that the kids see as part of their project and the success criteria that goes with it. They do their own learning we just sort of work alongside them. They get time to research and use those tools themselves before I intervene… “(PT04)

Participants acknowledged the importance of collegial support. They recognised that some had more knowledge than others and praised the capabilities of those teachers in the school who implemented digital technology more than they did. The challenge with this collaboration is that the filling in of the gaps requires that discussions be more about pedagogical change and development over task-based activities they can use.

“… more explicit with the kids so they are starting to think.” (TF06)

“… opened up opportunities for what I could do in my classroom… “(TF05)

Two thirds of participants were investigating apps and how to use them for tasks, without considering the management of behaviour, cultural equity, learning impact, setting the environment or whether it is appropriate for the task. This could lead to creating a digital environment where teachers were getting caught in the “gimmicky” aspect of digital learning (Blundell, Lee & Nykvist., 2016). This was highlighted by TP09’s response that its (digital technology) not there to entertain students or keep
them quiet. This highlights the fundamental challenges related to teachers integrating digital knowledge into practice. It does not mean that essential pedagogy is left out. Teacher practice and pedagogy is important to inclusive learning and student outcomes.

Participants were able to describe and comment on digital use that had been implemented in their school during the past one to five years. To varying degrees, they were able to identify several factors that influenced their decision making around the implementation of digital resources and tools.

“I was familiar with the concept of you know, using technology at different levels and I realised that when I’m thinking about what I do, it’s not always at the top level.” (TP09)

4.7.2 Anywhere, anytime...

Collegial support featured in this research project. Participants viewed their colleagues as professional learning support, whether it was discussions, meetings, sharing best practice, collaborating in planning, responding to questions or putting forward learning apps as options. Participants felt comfortable with their colleagues, were honest with their capabilities, felt no question was a dumb question, laughed together, brainstormed ideas and they had relationships with each other which added value to the development of their digital practice.

“I will just email or text FT06 or FT05 or what you have tagged me in.” (PT02)

Local groups found on Facebook seemed to be an ever-increasing source of development. Participant PT02 recalled never researching or looking for digital resources and did not associate these groups as evidence of their developing digital
practice. PT02 did not associate discussions with colleagues as developing practice or professional learning.

A disconnect can be experienced when there is no understanding of what is useful and what is necessary. The development of digital competencies by PT02 needed to be overt, face to face and formal. The apparent disconnect occurs in an informal setting; inexperience can confuse the meaning and importance of using digital tools in a transformative manner. There is also the fact that there is no filter on social media, therefore, some helpful advice or recommendations may, in fact, be distractions and simply are unable to work in different school settings.

Other teachers use and add on to what they find out on social media or local groups in their classrooms or if possible make time after school to go along to any sessions available. The different views, many discussion points and advice can cause issues, especially for inexperienced teachers who can at times try and use everything they find. While experienced teachers, see these discussion threads as opportunities to develop their own discussion points or inspiration to research further.

“I’m part of a group on Facebook where I see lots and lots of updates and new things that other people are trying and I try them out as well.” (TF06)

“I went to one because it was what we were wanting in our class … but then it was cancelled, but we didn’t know it was (cancelled) until we got there. “ (TF05)

Discussions in interviews and focus groups have tended to indicate that teachers prefer to learn as they go. TF05 highlights teachers desire to learn based on a perceived need in their class which then prompts action in the form of seeking collegial support or as TF07 states, self-taught usually in the form of internet surfing, reading and practice.
“... that's pretty much what I do like self-taught - it usually comes from a need in the classroom really... “(TF07)

4.7.3 Understanding Twenty First Century learning

Teacher participants’ understand that digital technology is the way forward, but have not delved into the research of it. The understanding is that 21st-century skills have to be developed, but the support in place to further those goals is lacking. The response below sums up the understanding of participants in this research project about 21st-century learners.

“Associated with a set of skills, collaborative skills adaptive type skills. I know there is, you know, a defined set of skills that are desirable.” (TP09)

“... mainly digital through the digital realm. Yeah, and engage them a bit more as in the how do you? Digital natives. So it's not really learning focused it's more communication more than anything well probably digital capabilities like being able to use it in the real world find information, really. Isn't it teaching them to teach themselves by using digital technology?” (TF07)

The participant’s response was indicative of all the responses received. They were all highlighting that digital technology was essential but were not too sure as to what else was relevant. This response brought in the understandings from different research undertaken, but when put on the spot, had to rally to connect them all. While participants were unable to answer what the all the skills of a 21st-century learner were, they did agree that it is no longer acceptable that you teach the way students were taught twenty plus years ago. For some, this meant they needed to develop their practice further by looking outside of the school. Just over half of the participants found
support through online teaching forums, family members or through local groups. All of these sources were informal however they enabled these teachers to put into practice some of the ideas others had found useful or were just starting to use.

4.7.4 Learning teams

Participants acknowledged that team meetings were an integral aspect of developing ideas and the use of digital tools and resources. This in-school professional learning is utilising the professional skills and knowledge of staff but also adding pressure to teachers who already have a full workload. For just over a half of participants, this was where they found most of the help they required. This also developed digital leadership by acknowledging those teachers who are working to assimilate digital technology already by asking them to unpack successful areas of digital practice. By allowing time between development for teachers to reflect and find areas of success or issues also added to the growth of their digital practice. The barriers to this source of PLD came from teachers leaving the meeting equipped with digital learning ideas. However, the notes stayed in their journals and they stayed with what they knew.

“So we will be sitting in literacy and they’ll be like, oh we want to do this and me and TF05 are like, oh we can teach you guys that. We can show you that. Me and TF05 took PD at the start of the year on what we have used in the past in literacy. And talked to the teachers about it and they were quite chuffed and some came and asked for more help because they felt they were ready to take that stuff on-board and some obviously weren’t quite ready in their digital abilities to want to go and take that next step.” (TF06)

Participants’ digital use was enhanced by the opportunity to discuss their successes and failures with colleagues. All participants were more than willing, no matter what their level of digital capability, to assist their colleagues. Participants who put the time
and effort into researching aspects of their practice felt the most confident to employ digital technologies including apps, online resources, collaborative enterprises and digital tools.

4.7.5 Pedagogy

Of interest to me was that participants acknowledged their engagement in professional learning discussions around aspects of digital technology use. Some participants were extremely active in reflecting on their pedagogy so that they can best meet the needs of their students and because of the changes that were happening schoolwide. The professional learning conversations specific to digital technology mentioned by a third of participants during individual interviews included some pedagogical aspect. Pedagogy, as understood by participants, are the “interactions between teachers, students, and the learning environment and the learning tasks.”

“Being someone who’s quite often thinking I’m on the wrong page. It’s for me like, oh yeah cool, someone else is thinking like that too and helps me grow as a teacher and then I’m better in front of my kids.” (TF06)

Highlighted in some of the participant’s responses was the importance that teachers placed on being reflective practitioners and developing their pedagogy. TF05 talked about completing research or having professional discussions with colleagues throughout their interview, which confirms the significance of informal professional learning as well as collegial support. Participants who tried out new strategies or digital resources, upon discovering that it did not work for their learning experience would amend planning, instruction and resources accordingly. Three of the participants recalled their experience of a flipped classroom. However just one of the participants included a comparison of different apps to assist with what might work best.
“She does Edpuzzle which is flipped classroom but it’s pretty basic I think seesaw is like kind of blogging and flipped classroom so it’s a little bit more advanced.” (FT06)

What was concerning were the participants who continually asked for help and often for the same thing. The support here needs to be ongoing, and developed with the support of senior management. Developing practice involves learning new approaches, strategies processes and information. Support whether formal, collegial or personal also highlights the need for sustainable learning rather than a “just for now” mind-set.

“I’ll go to our staff, or I’ll learn it and sometimes if I forget I go back about ten times.” (TP08)

“Putting it into planning, it will be easy to use because we’re not doubling up on work.” (TP08)

4.7.6 Key Findings - Collegial Support

It is crucial to the development of participants’ digital practice that they view all professional discourse as the potential for growing their digital practice. Capturing the ideas, strategies and resources communicated by professionals in any arena, whether Facebook, local groups, whanau, or colleagues. Infusing their growing knowledge with research of their own will ultimately enable their practice to strengthen, and be effective.

PT02 and TP08 did not realise that they were developing digital ideas for classroom use from online groups, colleagues and whanau. Barriers to participants learning in
these forums were confused by some of the information they were receiving and in some instances, their idea of what constituted PLD was the barrier. The reliability of groups they belonged to was also a barrier to their accessing the information and growth they were looking for in digital learning.

Lastly, the formal setting of team meetings enabled other participants to develop leadership while also realising that not all teachers were as enthusiastic or as capable. Sometimes teachers are not willing to add to an increasing workload unless they are confident that they have support for the content and time to use the resources. Teachers acknowledged the collegial support they received and also the need to undertake research which would enable digital teaching and learning with confidence and making decisions about the process. The barriers to their digital practice were highlighted in the professional discussions they had that were mostly task based.

To add depth to digital practice requires that teachers not only know their content but pedagogical approaches that link what they are doing not only to their student’s academic outcomes but also their social and cultural outcomes. It was evident from these discussions that participating teachers felt safe to adapt, reflect and change their pedagogy according to what they thought was best for their students.

The DLF was favoured by participants as a source of knowledge and support which would add depth to not only teaching and learning but their digital practice going forward.

4.8 Key findings overall

Each cohort had been arranged based on their years of teaching experience and in order to check whether each cohort had a similar or different perspective of digital use
in teaching and learning. An interesting picture emerged through the data gathered and from the different cohorts that I did not expect.

The PT cohort which were Provisionally Certificated Teachers were all similar in their digital use and perspectives.

- Workload was overwhelming therefore they only used what they were told to use.
- They did not have any ideas about how to use digital tools or resources and did not have time to research or troubleshoot issues.
- Did not feel like adding more to their workload by seeking PLD in this area as they were already having PLD for school-wide system changes and their curriculum learning team as well as Mentor teacher meetings, staff meetings and Centre meetings.
- Priority for them was according to what the school deemed a priority.
- Colleagues were their first point of call for addressing any digital issues or putting in place digital resources based on Centre need.
- Pedagogy was not considered when using digital tools and resources. They just used the apps, without managing how the app could develop the learning, student use or next steps.
- If a colleague wanted help with a digital issue they always tried to help even if they didn’t know how.

The TF (Three to Five years) cohort were different users of digital technology but had similar perspectives.

- When this cohort wondered whether there was a digital resource available for a particular learning goal, they researched until they found one.
- Consideration was given to the management of the resource/app, how to troubleshoot any issues and how it fit the learning.
Each of the participants in this cohort were often called on to assist others with digital resources, tool use and digital pedagogy, although they were not sure whether they understood it well.

PLD was not thought about in terms of digital assimilation because of school priorities but they each kept up with any new ideas or resources via facebook, family or teachers in other schools.

Access to enough devices for their class was a concern because of the frequent, planned use by this cohort.

The TP (Ten Plus years’ experience) cohort again were more similar in attitude but digital understandings were different.

- PLD for one participant in this cohort was based on school priorities. The other participant was taking a post-graduate certificate through the Mindlab.
- Reading or researching was not a priority for them, therefore the DLF had to be explained and examples given.
- Once they understood the DLF, they were positive about how it could lead to better lessons using digital tools and resources.
- Collegial support was important to them especially how colleagues assist them to do better.
- Planning by this cohort is digital, but lessons are more traditional with digital use applied to record students learning.
- If a colleague wanted help with a digital issue they always tried to help even if they didn’t know how and would laugh about their attempts.

Each cohort, even though coded as a way of keeping the identity of participants anonymous, showed emerging trends within each. The stories were so similar within each cohort, yet most of these themes were taken from the semi-structured interview with each participant and the discussions from the three focus group interviews.
5. CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the key themes from the research findings of this study in relation to the literature review. The chapter will provide a conclusion of the implications of the research findings based on the four research questions, followed by recommendations for future practice, the limitations of this particular study and finally recommendations for future study.

The findings of the study have produced three key themes:

1. The challenges of digital assimilation.
2. The value of a school based Digital Learning Framework
3. Support that matters.

5.2 The challenges of Digital Assimilation

According to McKnight, O'Malley, Ruzic, Horsley, Franey & Bassett (2016) there was a perception that, teachers having devices and a multitude of online resources available, could transform learning. This perception was held up as one of the challenges faced by teachers in this research project. Most of the challenges described by participants were based on their limited knowledge of how to transform learning using digital technology. In particular, being able to identify a starting place for teaching as well as what to plan for, in terms of mitigating technical issues, student management and agency because of digital technology. They therefore used them
within their practice to augment learning. One example was substituting an app for exercise books by having students brainstorm online instead of recording their brainstorm on paper. Another example was using presentation apps in the place of posters. Howard & Mozejko (2015) backed this substituted and augmented use up further by their findings that digital technology is being integrated into traditional pedagogical approaches. An example used was annotating text on an interactive whiteboard which in the past was done using an overhead projector and photocopied transparencies.

Grosemans et al (2014) acknowledged the speed of technological and societal change would challenge the knowledge and skills of professionals in changing and adaptive environments. Teachers’ pedagogical knowledge has to go beyond their knowledge of subject matter. Toyama (2011) correctly believes that technology use cannot transform learning if the implementation in the classroom is ineffective. Pedagogy involves understanding effective strategies for teaching a subject in ways that make it comprehensible. Participating teachers realised that just introducing an online app or resource was not going to transform learning and realised, an intentional digital approach, planned well, can have a positive impact. The Digital Learning Framework consisted of interaction among all three forms of knowledge: digital knowledge, pedagogical knowledge, and content knowledge. In other words, the most effective use of technology required an understanding of content and related educational strategies (Fullan & Langworthy. 2014).

The rich data in this research project identified three major barriers to teachers’ use of digital technology in the classroom:

1. Competing Priorities (Time and other school related tasks)
2. Lack of expertise and direction
3. Location (for PLD)
5.2.1 Competing Priorities

This was evident because there were so many competing priorities. The PLD support of other learning areas competed for the attention of participants' because of the school-wide system changes. Priority for PLD was in the areas supported by senior management therefore participants had enough on their plate and were unwilling to investigate externally provided PLD in digital technology, even though they would have liked to. The management of participants time was tightly scheduled because of timetabling, meetings, planning, Teaching As Inquiry, anecdotal notes and marking students learning which led them to rely on others to fill in the gaps of their knowledge.

Cox, Preston and Cox (1999) identified that without a clear and coherent sense of the reasons for educational change, (what it is and how to proceed), teachers become stuck in the same problem, of how to develop in a perceived area of need without an understanding of how to do that. This was evident in the learning areas supported by senior management where schoolwide changes were receiving the most attention, in order to develop practice. These researchers also concluded, the use of digital technology without support can lead to, following trends, superficiality, confusion and failure to develop in digital practice. Some of the participants did not have a clear direction when it came to using or developing digital learning. They were all well versed in its use for formatting planning, their administrative use and school administrative systems, however, this use did not necessarily translate into learning use in the classroom.

Day (1999), Bryer and Zavatarro (2011), Olsen & Sexton (2008) identified, a fundamental element of support was providing teachers with the time to learn about new tools, plan, collaborate and develop new curriculum. The necessary training and the management of change was non-existent with digital technologies in the data of participants who had to try and make sense of new technologies by themselves or through social media, friends, family and colleagues.
5.2.2 Key findings of challenges to digital assimilation

Primarily most of the challenges described by participants were based on their limited knowledge (not being able to identify what they needed to know or learn as well as a need to know the basis for learning). Their use of digital tools also lacked expertise and direction. The support for other learning areas competed for their attention leading to participants being unwilling to investigate externally provided PLD in digital technology. Other barriers to support with digital technology was the management of time, meetings and their reliance on others to fill in the gaps for them.

While forty four percent of the participants researched digital resources, including planning, assessment and teaching activities specific to conceptual learning, another forty-four percent admitted that they would do nothing to improve their digital practice unless it was an imperative, initiated by senior management or senior teachers. The last twelve percent described some research, but it was mostly task and device driven.

Some participants missed the importance of researching to stay up to date with digital tools, resources and linking those to planned learning experiences. The support these participant teachers viewed as essential required face to face discussions. The problem with not knowing what you don’t know is that when you do find out something, there are still gaps in that knowledge that need filling in. The filling in by some colleagues lacked substance because pedagogy was secondary to the purpose of these discussions. The collegial talks from findings were mostly tools and task based stemming from teacher and student engagement.

To enhance teaching and learning with digital technology teachers need to inform themselves of the possibilities and then plan for it. The teachers who researched upfront felt it enabled them to make informed decisions. They also had more confidence in their judgments in digital teaching and learning and felt ready to mitigate any issues (technological or behaviour).
What the participants did not realise and which came out during the evaluation of the Digital Learning Framework was the need for a shift in pedagogy to develop depth and lift the teaching and learning process through the use of digital tools.

**5.2.3 A Mixed bag of success**

Identified in the literature and relevant to the research project was Timperley et al (2007) and Wilson’s (2015), view, that ongoing professional learning is needed to assist teachers to meet the ever-changing digital knowledge base as well as training that distinguishes between what is hit and miss or appropriate pedagogy. Identifying the outcomes of what is to be learned, developing the intentions and then the approach to learning (which is where digital tools and resources can be assimilated). The critical issue was how digital technology is used by teachers, to support learning which came across as a mixed bag of success. The participants use of digital tools were mostly developed in isolation (without obvious Professional Learning Development support) and identified areas of need were based on what was happening in their classroom at the time. Their individual competencies impacted on what they could have done with digital technology versus how they were using them independent of each other. There was an obvious disconnect in some instances between the relevance of the digital tool or resource and the learning, because as some participants voiced “they don’t know what they don’t know”.

Forty four percent of the participants researched digital resources, including planning, assessment and teaching activities specific to conceptual learning. Another forty-four percent admitted that they did nothing to improve their digital practice, and highlighted that unless it was an imperative, initiated by senior management or senior teachers they would not go out of their way to add to their workload.

Fullan & Langworthy (2014) suggest, pedagogical knowledge permits teachers to assess how resources fit with planned learning experiences. Furthermore teachers often utilise online learning sites because a resource may lend itself to the learning
focus or experience. Another twelve percent described some research, but it was mostly task and device driven. Lokesh (2015) found a lot of technology use by teachers is born out of trying to engage students which was more about unnecessary enhancement because teachers inadvertently resort to games, music, or playing online. Ertmer, (1999) argued when digital technology is introduced in classrooms without structure and pedagogical application, disruption to existing routines can follow. Somekh (2007) points out, teachers use routines and associated intuitive practices to quickly read and respond in a wide range of situations. He further added that routines are important for teachers.

The importance of researching to stay up to date with digital tools, resources and linking those to planned learning experiences must not be under estimated. The support these participant teachers viewed as essential required face to face discussions. The problem with not knowing what you don’t know is that when you do find out something, there is still more to find out, especially with digital technology which can be out of date within six months. The filling in by some colleagues can lack substance because pedagogy is secondary to the purpose of their discussions. The collegial talks from findings were mostly tools based. Digital technology use by some participants could be misguided in that the focus was on the device and aspects of digital use that was not transformational, like how an app worked to augment learning.

To enhance teaching and learning with digital technology teachers have to inform themselves of the possibilities and then plan for it. The teachers who researched upfront felt it enabled them to make informed decisions. They also had more confidence in their judgments in digital teaching and learning and felt ready to mitigate any issues (technological or behaviour). However, the expectation on teachers to train themselves was fairly implicit.
5.2.4 A shift in pedagogy

What the participants did not realise and which came out during the evaluation of the Digital Learning Framework was the need for a shift in pedagogy for a variety of reasons but most importantly to develop depth and lift the teaching and learning process by assimilating digital tools into their educational approach. While learning from colleagues develops leadership amongst some, it also requires those that are sharing to advocate for the whole practice of teaching, not just the tasks.

Research into teachers, (Day, 1999, Hargreaves et al., 2001 and Goodson, 2003), have explored the complexities of practice and pedagogy, particularly when the context and substance of teacher learning is itself changing. In addition, Kington et al (2014) indicates that commitment to change and developing practice so that it is not surface deep, is essential to teachers adding to their practice by investing time and research.

Pedagogical application needs to be led by school leaders. School leadership determines the direction of school and community in regards to learning, well-being, cultural and digital innovations. The value placed on digital technology from all school leaders will determine how change is managed and how significant change require transformative pedagogies (Education Review Office, 2016).

5.3 Support that Matters

There is a suggestion that teachers sharing digital knowledge can create problems when the idea of transforming learning is at the forefront of any collaboration. The reason for this is that most of the sharing has been around tools and apps and not about applicable pedagogies. Lev Vygotsky’s (1929) cognitive development is just as important to teachers (all learners, not just students) because learners are influenced by their interaction with people, especially in social environments. The fact that all of
the participating teachers (whatever their level of digital expertise) helped each other in one way or another with digital technology highlighted that collegial support was at the forefront of participants learning experiences.

Many studies strongly suggest that collaborative learning has proven to be more effective than individualistic learning in contributing to motivation and in producing positive outcomes (Aubusson, Schuck & Burden, 2009; Zhao & Frank, 2003; Johnson, Johnson, & Stanne, 2000; Slavin, 1995; Snowman, McCown, & Biehler, 2009). Teachers learn from each other and often seek help from their colleagues. The collegial support offered by most of the participants showed the value of research but also that interaction in a less formal setting advanced the understanding of the digital resource, the approach chosen and intention of the learning.

This research project highlighted how much more some participants knew over others because they took the time to find out. The barriers faced by Provisionally Certificated Teachers to their digital practice was that their pedagogical knowledge was still being developed and that professional discussions with peers were mostly task based. This is borne out by researchers Bolstad & Buntting (2013) who determined, inexperienced teachers can develop learning using digital technology. However because pedagogy is still being learned, they purely focus on their strength, with apps and online resources.

Professional Learning Development (PLD) asks teachers to identify an area of need through Teaching as Inquiry and develop it to lift their practice by improving their pedagogical and content knowledge. Since any teaching strategy works differently in different contexts for different students, effective pedagogy requires that teachers inquire into the impact of their teaching on their students (Ministry of Education, 2009). Participants trusted in the spaces developed to share their understandings, queries and pedagogical understandings. These spaces however, were within school priority learning areas and because there was not a significant focus on digital learning, the only spaces for teachers to further this area was with each other, in their spare time or not at all. The implications of this was teachers determining what successful digital integration looked like on the basis of their colleagues practice.

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Monique Ngatoro
There is a large body of research around 21st Century tools, resources and skills that advocate the use of the knowledge-rich universe of the internet and all the resources and apps that lie within (Prensky 2001, Ahn 2011, Saavedra & Darleen 2012, Jukes, McCain & Crockett 2010, Kong 2014, Qian & Clark 2016). Some of the participants understood the importance of 21st Century skills and attributes and shared their use of digital technology among their curriculum team. They realised that not all teachers were as enthusiastic or as capable of employing digital tools and resources but were confident that if anyone required help that they could offer it, separate from the group meeting times. The research highlighted that confidence and workload can impact on the time to use or independently research digital resources. This is why direction and support from management is important to the development of any curriculum area and towards the success of change.

5.3.1 Support yourself

Butler & Sellborn, (2002) Otero et al, (2005) favour adopting a much more complex view of knowledge, one that incorporates knowing, doing and being. In doing so, we need to rethink our ideas about what support is required to develop our digital practice. In the new digital age. Siemens (2005) and Downes (2007) presented the connectivism theory, where social learning is integrated with social media technologies. It is crucial to the development of participants’ digital practice that they view all professional discourse as the potential for growing their digital practice. While capturing the ideas, strategies and resources communicated by professionals in any arena, whether Facebook, local groups, whanau, or colleagues, they must infuse their growing knowledge with research of their own to strengthen their understanding and practice.

A large body of critical analyses and research agrees that learning is not an individual acquisition activity, but a social discourse (Hanson & Sinclair, 2008; Jonassen, Howland, Moore, & Marra, 2003; Lave & Wenger, 1991). Teachers assisting others with changes to pedagogy and practice, who join online learning networks to keep abreast of changing technology and experiences, seek the recommendations of their
colleagues to help them manage these changes. Some of the participants agreed that some online social media support can be irrelevant and unpredictable, similar to obtaining advice from a colleague who does not invest time into research. There are forums for teachers to discuss professional, pedagogical and practice based issues, but at the end of the day they are discussions.

Some participating teachers did not realise that they were developing digital ideas for classroom use from online or local groups and whanau. They thought they were just doing it, until they had to think about where the idea came from. Barriers to participants learning in social media forums are the huge amounts of information being received for one question which can cause confusion because the information can be so different. The reliability of groups they belonged to was also a barrier to their accessing the information and growth they were looking for in digital learning because of cancelled meeting times and delayed replies.

Some of the participants had no other avenues of support because PLD offered outside of the main centres can be few and far between. Location plays a big part in what teachers can access in terms of PLD. The big conferences, like the GAFE Summit are always in the main centres and cost a lot extra in terms of transport, accommodation and course fees. Out of the nine teachers participating in this research project only three had attended PLD for digital technology in a formal setting in the three years prior to this study.

Howard & Mozejko (2015), Keengwe, Kidd, and Kyei-Blankson (2009), Borko, Jacobs, and Koellner (2010) all suggest, effective PLD for teachers is situated in practice and addresses problems of practice and furthermore that the expectation of digital technology use in the classroom should be clearly laid out by senior management and that the provision of appropriate technological and pedagogical support is key. Participants had prioritised their PLD based on senior management focus areas, as well as PCT participants acknowledging that unless they are told to do something
they won’t add to their workload. By providing support, and developing a shared vision of integration, a collective positive belief about and value of digital technologies and change can be created.

### 5.4 The value of a school based Digital Learning Framework (DLF)

The DLF included learning outcomes/intentions and examples of supporting activities that scaffold areas of learning with digital processes, ideas and online resources. Teacher participants found they could employ appropriate strategies and skills based on their pedagogical knowledge, to cause learning that is supported with digital technology where applicable and within key competencies; (reading, listening, viewing, speaking, writing, presenting; thinking, managing self, participating and contributing, using language, symbols and text, relating to others).

Teaching and learning frameworks are research-informed models for course design that help educators align learning goals with classroom activities, create motivating and inclusive environments, and integrate assessment into learning. These frameworks provide scaffolded, diverse approaches that help students “form knowledge structures that are accurately and meaningfully organised” while informing “when and how to apply the skills and knowledge they learn” (Ambrose et. al., 2010).

Bruce and Levin (2001) suggest that technology can be helpful in classroom settings by encouraging inquiry, helping communication, constructing teaching resources, and assisting students’ self-expression. The purpose of the DLF was realised for a third of the participants who were already inquiring into some aspects of digital practice. The framework provided support in the form of appropriate pedagogy by offering teachers a starting place in the form of progressions from which they can plan digital learning experiences as well as define next steps.
The other two thirds of participants needed further face to face guidance around using the DLF to develop digital learning that was embedded, rather than incidental, to their lesson design. Piaget’s “active learning” within the Flipped Classroom model (Bergmann and Sams. 2007) which is described by Scetto (n.d) as ubiquitous learning where the learners become active knowledge producers, rather than knowledge consumers. In order for all participating teachers to reach a level of competency with the DLF that one third of participants achieved. They too must become ubiquitous learners and active knowledge producers. Further emphasising, active knowledge making practices that underpin the trending significance of innovation, creativity, and problem solving. As teachers we constantly question our practice and pedagogy: How does the digital resource apply to their outcomes? Does it add weight to student’s understandings? How can a digital resource lift teaching approaches and highlight strategies being employed over traditional tools?

Research produced by Cox et al (1999), Fullan (1991), and Passey & Samways (1997) all maintain that teachers who resist change are not rejecting the need for change, but they are often the people who are expected to lead developments. Critical to this issue is how digital technology is used by teachers. The value of the DLF as seen by all participants was that it gave them a starting place and an example of what digital assimilation could be like. Participants also liked that there were intentions that were not huge but bite-sized and that there were examples of tasks to complement the intention. It was set out to get teachers started straight away but allowed them the freedom to adapt it for their class and level of expertise. Some of the participants welcomed the fact that the DLF showed progressions enabling them to add depth and develop pathways of learning.

An adaptable framework that supports the development of digital technology use is essential, while also promoting the expertise of teachers who use best practice and their experience with digital technology. Some of the participating teachers believed that a resource or tool that developed or assisted their digital practice would benefit students because their digital learning experiences would change from concomitant
use to being planned to cause learning. Some participants thought that their digital capabilities would be impacted by the DLF, not only by exploring a digital realm for their students' benefit but also their collaboration with colleagues as a local resource. They also sought to develop professional relationships with other schools nationally and globally via online learning communities.

5.5 Conclusions

The objective of this study was to ascertain what challenges teachers face with digital technology in one New Zealand school. Then from the perspective of participating teachers, identify whether the support offered in the form of a digital learning framework added value to their digital practice. The research questions arose from the overall aim of the research, which was to provide teachers with planning support in the form of a Digital Learning Framework (DLF) in order to assimilate digital technology into teacher practice.

The research questions are repeated below:

1. How can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?
2. What will assist with determining how the DLF is making a positive difference to teacher's digital practice will arise?
3. How will the DLF progress professional dialogue and guide decisions for teacher's digital development?

Summarised answers to these questions will now be outlined.
5.5.1 Can a Digital Learning Framework assist teachers with diverse digital capabilities to transform digital learning experiences?

To discuss the benefits and challenges of the first research question as perceived by participants at this school, a review of the definition of a learning framework and the support it offers will be outlined from the literature. Secondly, a review of the aspects that lead to transforming digital learning experiences. Thirdly, possible benefits and challenges of the DLF as highlighted by the teachers in this study will be outlined. Finally, suggestions of how digital technology can be transformative at this school will be outlined.

A Digital Learning Framework is a common reference with descriptors of digital competence for teachers and school leaders promoting innovative pedagogical approaches in which to embed the use of digital technologies. Important to any framework and highlighted by researchers McCombs & Vakili (2005) is that people are involved, therefore safety and support need to be priorities. It is also essential that any framework progresses learners with diverse, cultural and educational backgrounds, including teachers.

The study concludes that teachers are deliberately making pedagogical decisions in order to develop learners; crafting lessons based on their analysis of where their students are presently and, consider what steps are necessary for them to improve as recognised by Spencer (2009) and Spencer & Spencer (1993). Furthermore teachers who tended to research and advocate for their students to think wider and more critically used digital tools to guide and communicate in order to add value to learning. Transformation by embedding or assimilating digital tools and resources is initiated from the intention for learning. Fullan & Langworthy (2014) deduce that pedagogy should underpin the integration of any teachers practice. As leaders, digital pedagogy would be characterised by “value added” learning; critical thinking, communication,
creativity, collaboration, character building, and citizenship; and how technology can accelerate these.

This study concludes teachers in this research strongly supported the DLF because there was a desire to embed digital technology into their learning and they just wanted a starting point. The consensus of participants was identifying that they indeed had gaps in their digital practice and were excited to have a tool that included learning intentions, examples of tasks associated with the intentions and how digital technology could be employed within the learning experience. Also participants were pushed for time each day in the school term and by supporting them with available tools, resources, and planning within the DLF the support they received was instant and could be updated or adapted by them. Participants also valued the progressions that helped them to extend students learning even further and offered next steps in the learning.

The challenges for some participants was how they understood each element and how to take the learning out of a traditional teaching pedagogy. Although the learning intentions could be placed within any context, the digital assimilation came from how the technology lifted the learning intention not by substituting or augmenting digital resources and tools but by assimilating the technology into the learning. For example one of the participants Skype called a school in the Bay of Plenty as part of a collaborative exercise between Intermediates in New Zealand. The context was Reading, the Skype call was the technology, the engagement and interest of students was enhanced and sustained. For some of the participants this would not cross their minds because of inexperience or a workload that overwhelms their desire to expand their digital practice.

Suggestions for transforming learning by assimilating digital technology into teacher practice starts with the pedagogy. Pedagogy establishes the learning approach appropriate to the purpose of the learning. Within that approach teachers must think
of the digital age as constantly evolving and seek to support students as independent and collaborative users of technology. How much of the learning task can be independent; where students construct understandings, collaborate with peers and create a model of this knowledge using technology and what can be focused on to progress their understanding, without teachers taking over or taking back control.

By taking a position that challenges norms and assumptions, similar to kaupapa Māori research, teachers can involve the concept of the DLF as a possibility of change. The DLF’s aim is to make a positive difference. Therefore the use, usefulness and ownership of this research is important only as much as teachers are willing to apply it to their digital teaching practice.

5.5.2 What evidence will there be that the DLF makes a positive difference to teacher’s digital practice?

The findings of this study highlighted some key areas in relation to the difference the DLF made to teachers digital practice. It also highlighted areas missing in digital practice and pedagogy as well as the challenge of digital capabilities that created some confusion around the purpose of the DLF. These are outlined below.

Teachers shared their use of digital technology which included communicating with their colleagues, collaborating on a shared document to plan and add to their planning later. They used YouTube clips, images, and music in slides to present to their colleagues. Teachers commented on shared planning documents and scanned the depth and breadth of the internet for resources. The problem identified from their responses was translating the value they place on that technology for themselves into planned learning experiences for their students using pedagogical approaches to lift the learning experience from one of teacher-centered to teacher-student co-constructed.
The study concludes that, the DLF was valuable for the teachers who were already using digital technology in teaching and learning and were positive with the additional planning support it provided. Teachers who were keen to improve their digital practice also engaged with the DLF. However professional learning development was still key to all teachers engaging with the DLF. Supported by Borko (2004), Desimone (2009) and Grosemans, et al. (2014) was the PLD environment in this study which stemmed from the focus group interviews and informal discussions with colleagues outside of the set questions, gaining a range of participants’ perspectives (Cohen et al., 2007). Some teachers required further clarification of some of the elements which held back their understanding as to how the DLF supported embedding digital technology into planning.

The study has concluded that teachers’ positive view of the DLF, even the teachers who required additional support to understand it was because they heard the interest and positive feedback offered by other participants. This was highlighted by Zhao & Frank, (2003) who found that because the opinions of their colleagues were important to teachers, they were more likely to engage with support being offered if colleagues showed an interest. They wanted to use the DLF but digital competence and confidence was a barrier. Some of the participants in this research project still require support to understand the components within the DLF, while others felt it offered their teaching practice the lift they needed to use digital tools and resources better.

Furthermore the study concludes an area that could have been improved on was paying attention to the teachers who needed more assistance with understanding the DLF. An indication that more help was needed came from the responses of some teachers, which were highlighted in the analysis of data. An example was the query of doubling up on work. This showed that teachers who were challenged by digital technology would probably require additional support. Clarke et al., (2008) acknowledged successful assimilation of digital technology benefits teachers when the environment commits to meaningful innovation and change. Bates (2015) urged, a...
framework that supported teachers transitioning into digital landscapes could not be underestimated.

5.5.3 How will the DLF progress professional dialogue and decisions for teacher’s digital development?

Through discussions, the value participants placed on support and guidance was most evident. Participants actively judged how the DLF would fit into their knowledge base and of course their teaching practice. Highlighted throughout the research project were built-in assumptions. These included what the participants understood in terms of supporting their learning, why they were using technology, why they were not using technology, the value they placed on the use of the DLF, work responsibilities, and the methods and procedures that enabled these teachers to carry out commitments to their school community, and most importantly their students.

The evaluation of the DLF saw the values of each participant come to the fore. They were subject to not only their digital teaching practice but also cultural perspectives, attitude to a change of practice and political viewpoint. The whole makeup of each participant counted towards what was important to them as an individual and a practitioner. The literature indicates that “teacher learning requires time and commitment if substantial rather than cosmetic changes in practice are to occur” (Kington et al 2003). This was indeed evident in the participants’ energy and commitment to this research project. The time they gave to the interviews, focus group and desire to learn. However the learning they need has to be on-going and as Lev Vygotsy indicates, with other people.

The DLF, while intentions were good, will not in itself assist teachers to make the pedagogical and practice based changes needed. In order to affect change for their students they will need time with a mentor or within a PLD environment to develop
understandings. It can give them a starting point, add depth and identify where to next, but teachers will need to make an effort to seek PLD to further their digital competency.

The literature by Gratton & Erickson (2007), Hargreaves (2001) and Timperley et al. (2007), reinforces a collaborative and constructive approach between senior management and staff with a focus on practical support if a change in digital practice and pedagogy is to succeed (Harvey & Broyles, 2010; Loughran & Hamilton, 2016).

5.6 Recommendations for Practice

The following recommendations have been put forward with direct reference to the participating school but, may be of interest to other New Zealand schools that endeavour to mitigate the challenges associated with digital technology uncovered in this research, or the possible implementation of a Digital Learning Framework specifically for their school. The recommendations for practice have been categorised under two aspects:

1) Recommendations for Professional Learning Development, and;
2) Recommendations for employing the DLF in the school of study.

5.6.1 Recommendations for Professional Learning Development

1. Professional development should develop a balance of theory and practice that allows teachers the opportunity and time to apply new learning to practice (Timperley et al, 2007). In this school, to restore balance, it is recommended that professional development adopts a focus on pedagogy that includes digital approaches identified in the DLF and research. Alongside this, it is suggested
that internal expertise is developed further in order to build capacity across the school in digital pedagogy and practice.

2. This research also recommends that teachers with the expertise be given extra release to research, identify appropriate PLD specific to digital pedagogy and practice in order to maintain manageable workloads. Teacher feedback should be sought and utilised to ensure professional development is meeting the needs of its participants.

3. Senior management should expose staff to professional learning development within daily practice that assists teachers with the explicit assimilation of digital technology specific to Centre approaches without using additional time in their working week. This could involve a planned lesson or series of lessons that embeds digital aspects within the intention and associated outcomes. Centre approaches are encapsulated within the lesson/s to support teachers to understand how digital assimilation is transferable to all learning areas.

5.6.2 Recommendations for employing the DLF in the participating school

1. Professional development should provide practical support on how to employ the DLF successfully for all teachers. The challenge of teachers being time poor, was deemed a challenge by all participants in this study as well as in the literature (Friend, 2000).

2. Collaboration within Centre teams and time to develop clear understandings of digital assimilation as presented in the DLF is essential. Internal expertise developed within Centres could minimise extra time needed as planning could be attended to within scheduled meeting times. As stated above, time to plan is essential to successful collaborative teaching (Friend, 2000; Kluth & Straut, 2003).

3. Utilising the team culture already in place in the school, instead of additional time set aside in a week, to assimilate the DLF into pedagogical approaches, best practice and Teaching as Inquiry professional learning, being targeted by each learning team.
5.7 Limitations

The limitations of this study. The study focused on only one school in the early stages of a change initiative. The change initiative was known to be occurring by the researcher at the outset but, it was seen as relevant to the integration of digital technology. The study involved a small number of participants, hence, the findings are very specific to this school and a small number of its teachers. The participants were also volunteers. There were two other teachers who would have liked to participate but decided they could not afford the time. The study did not directly provide opportunities for management to share their views on many digital aspects as outlined in the study. This limited the study's findings because the research indicated the importance of leadership as a driver for innovative digital practice. This would have added to the understanding of the researchers’ findings which were solely based on the views and opinions of teachers.

The workload during the last term of the year impacted on the study as the last focus group meeting had to be cancelled due to school priorities. It was planned for that time so that the researcher could ascertain whether the DLF had a direct impact on teachers planning of digital learning experiences.

Although the study focused on the challenges of digital assimilation and the value of a Digital Learning Framework, other large scale changes were also in play at this school, such as the transition of core learning areas into specialised groups across the school. The teaching and learning of Literacy, Numeracy, Health & P.E as well as Intermediate Technology specialisations were based on teachers identifying areas of strength from which they will teach and restructuring lessons to maximise and accelerate outcomes. This could have limited the findings because participants' responses were also coming from, how can I use this, within this area? Also their professional focus was on the pedagogy and practice of being a Literacy, Health &
P.E, Tech or Numeracy teacher, limiting their digital scope to their teams’ context and collaborating on the structure of learning sessions.

The study was also limited in that it did not delve deeply into some of the key areas that may have been of interest and add more depth to the research findings. For example what makes a digital approach transformative and what form does that take for teachers in a classroom. The evidence of a digital practice being transformative is mentioned in many research papers but there is not enough detail around how that is accomplished, what it looks like and how teachers get it there. To bring about change for those that have been marginalised through the processes of education and schooling (Milne, 2017), transformative teaching and learning with digital technology has to maintain and put at the forefront of digital pedagogies, the cultural capital and values of students.

In this school the daily challenge was time, so research into digital assimilation that develops into transformative teaching and learning was not a priority. Similarly, establishing collegial support systems, which was often, seek help when needed for some, because they don’t know what they don’t know, until it comes up.

Another possible limitation in this study was the fact that it was practitioner research, where pre-existing relationships could have inhibited participants’ responses and what they perceived as relevant to the research. Pre-existing relationships could also have influenced the priority given to readings which could have affected the accuracy of responses.
5.8 Recommendations for Future Study

Educational change is highlighted in many research papers and government papers especially in a digital context whether Digital natives, 21st Century Learning, Future focused learning; it is crucial that teachers adapt and move with the times.

The fact that the curriculum was updated to include digital strands in the Technology curriculum highlights that it is important to the future direction and career opportunities of our students. This study only focused on one school and nine of its’ teachers. However, as pointed out by Kington et al (2014), teacher learning requires time and commitment if substantial rather than cosmetic changes in practice are to occur which needs the support of senior management as suggested by Harvey & Broyles (2010).

This study has not provided information on future plans to introduce the DLF into PLD or by any means the school where the research was carried out. There was no data gathered from senior management or students, as the research was focused on teachers assimilating digital technology into their practice and the support they need. For these reasons I suggest a number of aspects of this topic that are worthy of further research, including:

1. A longitudinal study of training teachers and the requirements of digital approaches to more fully establish whether digital pedagogies are leading training teachers towards a digital practice or traditional practice augmented with digital technology.
2. Specific research into whether changing pedagogical approaches, the use of digital technology and culturally inclusive practices lift educational disparities of marginalised Māori and Pacific students.
3. More in-depth research on the characteristics of successful transformative teaching and learning in New Zealand schools and its effect on student engagement, motivation and achievement.
4. Research on the potential effect, of PLD for digital technology use by teachers that is delivered and progressed by in-school digital experts.
5. A more focused study on what is actually going on in schools across New Zealand with digital fluency and what is the evidence that digital technology is being successfully assimilated into teachers practice.

6. Research on how New Zealand schools can adapt pre-existing systems with digital pedagogy to ensure teacher workload remains manageable.

7. Detailed research into the challenges teachers face when implementing digital technology into teaching and learning, and what are the characteristics of those challenges.

5.9 Final Word

This research was borne from my perception that colleagues were experiencing a range of issues implementing digital technology into their practice. I saw many uses that were a waste of time and many that pulled students into learning like nothing else could. It is essential that all staff who are committed to change ensure equity of current educational pathways and future career opportunities for all students, but especially marginalised students. These teachers must lead by example and take the rest of the staff with them.

Changes down this route can be minimal but traction can be gained by influencing the percentage who want to develop digital technology in their practice. This was evident during this research project and especially during the interview process. Some teachers were available to others on request to assist with digital use in the classroom and to troubleshoot problems with technology. Was their digital use transformative, yes and no. They were however committed to change and developing their digital use as teachers who want their students to engage in a technological future.
What is necessary is to provide proper instruction, that is adapted to the needs of teachers who may be learning new skills and to ensure that the new learning/knowledge is achievable. Guidance, time and opportunity to reinforce practice ensures the changes occur. Workload and time were identified strongly as factors that inhibit teachers from adding to their practice outside of what they have to do normally. I wanted to explore how teachers could be supported, which led to the development of the DLF which I saw as a way to support teachers in a small practical way. More prominently, the study provided teachers in this school with a voice.

The study has made some recommendations that may help this school and the teachers move forward positively.

Personally, I have a feeling of achievement and hope. Completing this research is an achievement in and of itself, let alone the learning from research that I would never have delved into if I had still been working. I hope that the school picks up on some of the recommendations and that teachers are given the time they need to develop in areas they identify as important to their practice, including digital technology. The findings of this study are closely aligned to previous literature and importantly I have gained an understanding of how practitioner research can be valuable in terms of research related literature and current contexts. Equally important in terms of my own cultural perspective is that the Kaupapa Māori methodology allowed me to gain deeper understandings of the barriers and successes faced by my peers, while respecting and valuing the stories they entrusted me with.

I have such an appreciation of our profession. Teachers demonstrate commitment to their practice, the long hours, constant additions and adjustments being made to their practice due to research or what is perceived as being educational. I was loathe to recommend additional PLD in what is seen as an area of importance to so many people. However, teachers have to keep abreast of what is important and digital technology in teaching and learning has its' place in education. As outlined in this
study, for some teachers they need to initiate research and start developing their practice in this area. For the school, the support required needs to be from the top down to gain momentum and to add value to the educational goals and future prospects of all students.
GLOSSARY OF MĀORI TERMS

Aroha - Love and within that concept respect, compassion, empathy and care. A respect for people—allow people to define their own space and meet on their own terms (Smith, 1999).

Hapū - kinship group, clan, tribe, subtribe - section of a large kinship group and the primary political unit in traditional Māori society. It consisted of a number of whānau sharing descent from a common ancestor, usually being named after the ancestor, but sometimes from an important event in the groups' history. A number of related hapū usually shared adjacent territories forming a looser tribal federation (iwi) (Moorfield, 2019).

Iwi - extended kinship group, tribe, nation, people, or race – often refers to a large group of people descended from a common ancestor and associated with a distinct territory (Moorfield, 2019).

Karakia - prayer, incantations, ritual chant, a set form of words to state or make effective ritual activity (Māoridictionary.co.nz) – Spiritual essence of Māori; ensuring all forms of wellness are accounted for (Durie, 1994).

Kaupapa Māori - An anti-colonial, counter-hegemonic approach (Smith, 2005) and term used to describe Māori ways of doing, being and thinking, encapsulated in a Māori world-view or cosmology (Henry & Pene, 2001).
Kete - Basket – often used in reference to education and learning as applied to filling your basket with knowledge (Calman, n.d).

Kia Tūpato - Be cautious. Forms part of Kaupapa Māori ethical code of research practice. This suggests that researchers need to be politically astute, culturally safe, and reflective about their insider/outsider status. It is also a caution to insiders and outsiders that in community research, things can come undone without the researcher being aware or being told directly (Smith, 2005).

Kōrero - To speak, read, talk or address (Moorfield, 2019).

Kotahitanga - Unity, togetherness, solidarity, collective action (Moorfield, 2019).

Māhaki - To be inoffensive or humble (Moorfield, 2019). This is about finding ways to share knowledge, to be generous with knowledge without being a “show-off” or being arrogant. Sharing knowledge is about empowering a process, but the community has to empower itself (Smith, 2005).

Mana - Prestige, the spiritual power and authority that can be applied to people, their words and acts (Henry & Pene, 2001).
**Manaakitanga** - The process of showing respect, generosity and care for others. (Moorfield, 2019). Sharing, hosting, and being generous. This is a value that underpins a collaborative approach to Kaupapa Māori research, one that enables knowledge to flow both ways and that acknowledges the researcher as a learner and not just a data gatherer or observer. It is also facilitates the process of “giving back,” of sharing results and of bringing closure if that is required for a project but not to a relationship (Smith, 2005).

**Mātauranga** - Knowledge, wisdom, understanding (Moorfield, 2019).

**Ngāti Porou** - A Māori tribe belonging to the East Coast of the North Island.

**Whānaungatanga** - Relationship, sense of family connection - a relationship through shared experiences and working together which provides people with a sense of order or belonging. (Moorfield, 2019)

**Te ao Māori** - The Māori World (Moorfield, 2019)

**Te reo Māori** - Language (Moorfield, 2019)
**Tikanga** - Customs of Māori, their method or way of being and doing – the customary system of values and practices that have developed over time and are deeply embedded in the social context (Moorfield, 2019). From the root “tika” tikanga also refers to a ‘correct way’, authentic practice.

**Timatanga** - Beginning, starting, introduction (Moorfield, 2019).

**Titiro** - Look at, examine, observe, survey (Moorfield, 2019).

**Titiro, whakarongo, kōrero** (In terms of this study) - Looking and listening (and then maybe speaking) in Kaupapa Māori research methodology. This value emphasizes the importance of looking/observing and listening in order to develop understandings and find a place from which to speak (Smith, 2005).

**Tūhoe** - A Māori tribe that belong or are descendants of the wider area of Te Uruwera.

**Tutu** – a term used to express hands on curiosity (Moorfield, 2019).

**Whakamutunga** - End, concluding, final (Moorfield, 2019).
**Whakarongo** - To listen or hear (Moorfield, 2019).

**Whakataukī** - An inspirational or wise saying similar to a proverb whose author is unknown (Moorfield, 2019).

**Whangai** – cared for or nurtured as part of extended/adopted family (Keane, 2017)
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**APPENDICES**

Appendix A: Digital Learning Framework (DLF)

ATTACHED AS A PDF
Appendix B: Participant Consent Form

Participant Consent Form
**Research Project Title:** The value of a school based Digital Learning Framework:
Does it offer the support and guidance needed for teachers of varying digital capabilities?

I have had the research project explained to me and I have read and understand the information sheet given to me.

I understand that I don’t have to be part of this research project should I choose not to participate and may withdraw at any time prior to the completion of the research project.

I understand that everything I say is confidential and none of the information I give will identify me and that the only persons who will know what I have said will be the researcher and their supervisor. I also understand that all the information that I give will be stored securely on a computer at Unitec for a period of 10 years.

I understand that my discussion with the researcher will be taped and transcribed.

I understand that I can see the finished research document.

I have had time to consider everything and I give my consent to be a part of this project.

*Participant Name:* ……………………………………………………………………………………………………………………………

*Participant Signature:* ………………………….. *Date:* ……………………………

*Project Researcher:* ……………………………. *Date:* ……………………………

**UREC REGISTRATION NUMBER:** 2017-1047
This study has been approved by the UNITEC Research Ethics Committee from 18 August 2017 to 18 August 2018. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

**Appendix C: Participant Information Sheet**

![Unitec Logo](unitec-logo.png)

**Participant Information Form**

Monique Ngatoro
My name is Monique Ngatoro. I am currently enrolled in the Masters of Applied Practice degree in the CISC9090 at Unitec New Zealand and seek your help in meeting the requirements of research for a Thesis course which forms a substantial part of this degree.

The aim of my project is:
To conceptualise a Digital Learning Framework (DLF - appendix A) that may provide guidance within teaching and learning that supports the integration of digital technology into teacher practice.

These are my objectives:
Objective 1 - Equip teachers with digital learning support.
Objective 2 – Increase teacher’s confidence and capabilities when using digital technology with the support of the DLF

I request your participation in the following way:
The purpose of this project is to evaluate the usefulness of an adapted Digital Learning Framework (DLF) as a support for teachers when planning digital learning experiences. The DLF will provide guidance through examples of learning intentions and learning ideas/experiences within focus areas (elements).
The evaluation process will develop the elements, learning intentions and possible learning ideas/experiences of the DLF until it is a tool that teaching staff with any level of digital competency in the participating school can use when planning.

Research Project Process:
1. Interview participants as to their current digital practice and the support they might need.
2. Review how the established DLF in its current form might support and guide teacher practice by sharing the DLF with participants and then seeking feedback/critique in a focus group (ease of use, relevance to curriculum and digital technology tools).
3. Identify areas for improvement.
4. Make adjustments to the DLF if needed.
5. Restart the process and continue to do so until all participants agree that the DLF supports / does not support their digital practice.

Level of Commitment

1. Introductory Meeting (approximately 45 minutes)
2. Sign consent forms (If you decide that you would like to participate in the project)
3. Individual interview with researcher (approximately 30 mins).
4. Use the DLF as a support for planning your digital learning experiences.
5. Meet as a Focus Group every 2 – 3 weeks (as per schedule - 4 Focus group meetings in total).
6. Each meeting will require 1.5 to 2 hours of your time to explore whether there are problems you have found whilst planning - discussions towards amending or adapting the DLF.

The organisation will be indirectly identified in the Thesis, however all participants names will not be used. The results of the research activity will not be seen by any other person in your organisation without the prior agreement of everyone involved. You are free to ask me not to use any of the information you have given, and you can, if you wish, ask to see the Thesis before it is submitted for examination.

If you decide to participate and have given consent and then withdraw from the project I will still use the information that you have provided up until that point unless you ask me to withdraw all of your information.

I will audiotape interviews so that I do not use your information out of context and can listen carefully to what you have to say. I will then type up transcripts of your interview so that you can change, delete or add to comments you have made before using your information. Data gathered from all participants will be stored in a password protected google folder and will then be destroyed after a period of 5 years.

I hope that you find this invitation to be of interest. If you have any queries about this research, you may contact my principal supervisor at Unitec New Zealand.

My supervisor is Jo Mane. Phone: 815-4321 ext. 7146 or email: jmane@unitec.ac.nz

**UREC REGISTRATION NUMBER: 2017-1047**

This study has been approved by the UNITEC Research Ethics Committee from 18 August 2017 to 18 August 2018. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix D: Participant Schedule

Research Project: THE VALUE OF A SCHOOL BASED DIGITAL LEARNING FRAMEWORK: DOES IT OFFER THE SUPPORT AND GUIDANCE NEED FOR TEACHERS OF VARYING DIGITAL CAPABILITIES?

Schedule of Meeting times for project participants.

Date               Meeting Description
25th September 2017 - Introductory Meeting: Introduce project Aim and objectives to senior management and potential participants Objectives and DLF. Question and answer session.

9th October 2017 - Professional discussions Issues and/or benefits. Adapt DLF
6th October 2017 - Professional discussions Issues and/or benefits. Adapt DLF
23rd October 2017 - Professional discussions Issues and/or benefits. Adapt DLF
6th November 2017 - Professional discussions Issues and/or benefits. Adapt DLF
Appendix E: Focus Group Questions

Research Project Title: The value of a school based Digital Learning Framework: Does it offer the support and guidance needed for teachers of varying digital capabilities?

Focus Group Discussion Questions

1. What particular challenges are there when using digital technology for learning?
2. Did you feel equipped to handle the challenges by having the DLF to support what you knew and giving you guidance with what you didn’t know? Explain
3. How did the DLF help you or hinder you when planning?
4. Was the DLF easy or difficult to follow/use? Explain (What would make it better?)
5. Do you think there are too many elements or do you think more need to be added?
6. Would the learning intentions that are already in the DLF guide you to adding your own or do you think there are too many?
7. How useful are the examples of learning ideas/experiences?
8. Would it be O.K to call the DLF a working document so that teachers who are finding out what is or isn’t useful can add to the DLF?
9. Does the DLF allow you the freedom to use appropriate pedagogies when planning?
10. Rate the DLF at this point in time. (1 being not good at all and 10 being excellent)
Appendix F: Participant Interview Questions

Interview QUESTIONS.

1. Which best describes you.
   A. Provisionally certificated Teacher
   B. 3 - 5 years’ experience
   C. 5 - 10 years’ experience
   D. 10 - 15 years’ experience
   E. 20 - 30 years’ experience

2. What does the term 21st century learner mean to you?

3. How do you manage your own professional growth in digital technology?

4. If you were to rate your digital competency between 1 and 10 (1 being not good at all and 10 being excellent), what would you give yourself?

5. What support do you think is important to developing your digital practice?

6. How often do you or have you taken part in technology Professional Development opportunities?

7. In what areas has digital learning support been offered? (Circle as many as you want)
   A. Google apps for education.
   B. Online resources and content for learning activities.
   C. Collaborative teacher/student applications and Flipped Classroom resources such as Seesaw.
   D. Connecting learning outcomes and intentional understandings to digital resources.
   E. Intentional learning design with digital resources and content.
   F. Professional learning development specific to any of the above.
   G. Help with online resources and content from colleagues.
   H. Self-taught by spending time developing digital knowledge and capabilities.

8. What support or guidance do you think you will get from the Digital Learning Framework?

9. How often do others come to you for guidance in using technology? (Do you offer guidance when not asked? If so, describe how you did this recently?)

10. Do you think the DLF will be a useful guide for other teachers?

11. Do you have any concerns or areas of this research that you would like to address at this time?
Appendix G: Participant Confidentiality Agreement

Research Project Title:

The value of a school based Digital Learning Framework: Does it offer the support and guidance needed for teachers of varying digital capabilities?

Participant's Name:

Phone number:

Email:

I ___________________________________________________ (full name - please print)

Agree to treat in absolute confidence, all information that I become aware of during the course of participation in the above research project. I agree to respect the privacy of those involved and will not divulge in any form, information with regard to any participating person or institution and agree to not retain or copy any information involving the above project.

I am aware that I can be held legally liable for any breach of this confidentiality agreement and for any harm incurred by individuals or organisations involved, should information be disclosed.

Signature:..............................................................

Date: ..............................................................

UREC REGISTRATION NUMBER: 2017-1047
This study has been approved by the UNITEC Research Ethics Committee from 18 August 2017 to 18 August 2018 If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph: 09 815-4321 ext 8551). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Monique Ngatoro
Appendix H: Responses from Interview questions 4 and 7

<table>
<thead>
<tr>
<th>Title</th>
<th>Type of information requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital competency (rating)</td>
<td>Q4. If you were to rate your digital competency between 1 and 10 (1 being not good at all and 10 being excellent), what would you give yourself? Why?</td>
</tr>
<tr>
<td>The most helpful digital learning support in this school presently?</td>
<td>Q7. In what areas has digital learning support been offered? (Circle as many as you want)</td>
</tr>
<tr>
<td></td>
<td>A. Google apps for education.</td>
</tr>
<tr>
<td></td>
<td>B. Online resources and content for learning activities.</td>
</tr>
<tr>
<td></td>
<td>C. Collaborative teacher/student applications and Flipped Classroom resources such as Seesaw.</td>
</tr>
<tr>
<td></td>
<td>D. Connecting learning outcomes and intentional understandings to digital resources.</td>
</tr>
<tr>
<td></td>
<td>E. Intentional learning design with digital resources and content.</td>
</tr>
<tr>
<td></td>
<td>F. Professional learning development specific to any of the above.</td>
</tr>
<tr>
<td></td>
<td>G. Help with online resources and content from colleagues.</td>
</tr>
<tr>
<td></td>
<td>H. Self-taught by spending time developing digital knowledge and capabilities.</td>
</tr>
</tbody>
</table>

Digital Competency Ratings (initial answer, before DLF).

![Digital Competency Ratings Chart]
In what areas has digital learning support been offered?

A. Google apps... 7 (87.5%)
B. Online resour... 6 (75%)
C. Collaborative... 6 (75%)
D. Connecting l... 3 (37.5%)
E. Intentional lo... 3 (37.5%)
F. Professional l... 1 (12.5%)
G. Help with onli... 8 (100%)
H. Self-taught b... 5 (62.5%)
**Full name of author:** Monique Ngatoro

**Full title of thesis/dissertation/research project** ('the work'):

The value of a school based Digital Learning Framework: Does it offer the support and guidance needed for teachers of varying digital capabilities?

**Practice Pathway:** Negotiated Studies (Extended) DCL Pathway  
**Degree:** Master of Applied Practice  
**Year of presentation:** 2019  
**Principal Supervisor:** Dr Jo Mane  
**Associate Supervisor:** Dr Hayo Reinder

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Unless otherwise stated this work is protected by copyright with all rights reserved. I provide this copy in the expectation that due acknowledgement of its use is made. AND

**Copyright Compliance:**  
I confirm that I either used no substantial portions of third party copyright material, including charts, diagrams, graphs, photographs or maps in my thesis/work or I have obtained permission for such material to be made accessible worldwide via the Internet.

**Signature of author:**  
**Date:** 15/02/2019
Declaration

Name of candidate: Monique Ngatoro


CANDIDATE’S DECLARATION

I confirm that:

- This Thesis represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee. Research Ethics Committee Approval Number: 2017-1047

Candidate Signature: [Signature]
Date: 15/02/2019
Student number: 1452322