Students' Voice on Mobile Technology and Web 2.0 Tools for Learning

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Abstract

Literature tells us, and from my own observations as an experienced teacher, when students have a mobile device in hand they show signs of being motivated, and a phenomenon takes place where students display a natural curiosity and engagement with the device through various interactions. The purpose of this study was to validate students' voice by allowing them to express their views on the use of mobile technology and Web 2.0, whether they found them motivating and engaging, and how they perceived them as being useful for learning. Students' perceptions of current and emerging technologies and their usefulness can differ to teachers' perceptions, therefore research involving conversations with students are needed to better understand how they perceive and relate to these technologies. This study has had such conversations in order to uncover students' perceptions. Gathering students' views gives us a first-hand view on what affects them. It identifies factors that perpetuate or diminish their learning, that educators may not have considered before. Knowing and understanding *how it is* for students, helps to improve learning conditions for them.

While there is an initial phase of excitement and curiosity that students have when using mobile technology and Web 2.0, this quickly passes and there are learning conditions that need to be met in order for motivation and engagement to be sustained. To sustain their motivation, students need to have self-determination. For students to be self-determining, their needs for autonomy, competence, and relatedness must be met. This thesis has determined, through the voice of students, that their need for autonomy can be met through the affordances of mobile technology and Web 2.0, but *the teacher's role is vital* for meeting their needs for competence and relatedness.

The findings from this study strongly argue that the teacher has a vital role to play in ensuring students' learning experiences supported by technologies are *effective,* and assumptions around students' knowledge, skills and understanding of using

technology in formal learning situations needs to be checked. Teachers need to robustly scaffold the use of technology in learning situations until students have built up competence. Teachers need to keep relating to and conversing with students, and not assume students do not need support when using technologies characterised by autonomy and independence. It also found that the learning conditions must support students' needs for self-determination if students are to *stay* motivated and engaged – the use of technology alone is insufficient. It also highlighted equity and access to technology learning opportunities for all students, students' informal learning, and influences on students' perceptions as to whether they considered technologies were useful for learning.

<u>Acknowledgements</u>

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Chapter One: Introduction

As an educator, I have rarely come across students who did not get excited over the opportunity to use iPads, or some other form of mobile technology during class time. When a student has possession of a mobile device, they show signs of being motivated, and a phenomenon or type of 'sensory experience' takes place. We can observe a student's natural inclination or curiosity to engage with a device through the various interactions that they involve themselves in while using the device. When students access these technologies, their learning experience differs from traditional types of learning. Knowing and understanding students' learning experiences supported by mobile technology and Web 2.0 tools is the quest of this study.

With the proliferation of mobile and Web 2.0 technologies, they have become more desirable and accessible to support learning. Originally designed for the business world or personal use, educators are now using them increasingly to positively affect students' learning. Web 2.0 tools are constantly being created and used for the purpose of social networking and content sharing, and are also being used in the classrooms and across learning contexts to support students' learning. This study will explore the effectiveness of mobile technology and Web 2.0 tools for motivating and engaging students, and the lived experiences of students who use these. To achieve authentic accounts of students' experiences, students themselves should be an integral part of the research.

What we can learn from students' experiences, whether positive or negative, offers insights to designing effective future learning programmes. From personal accounts we are able to better describe the ways in which students find these particular technologies motivating and engaging, or if indeed they do. This study specifically seeks to understand the experiences and views of secondary school students using mobile technology and Web 2.0 tools in learning situations. Burden and Atkinson (2007) point out, we should not be asking what the tool could do, but rather we should be asking what students could do with the tool. While there is research from

the perspective of educators, this study aims to specifically accentuate the views and the voice of students by examining their experiences.

1.1 Significance of study

This study is valuable in several ways. First, it gives us a personal account from students about their learning experiences supported by mobile technology and Web 2.0 tools, and the meanings they attribute to them. It also attunes the educator to students' views and perspectives on matters surrounding the use of these technologies. It is the hope of this study that the research school will find the views of its students enlightening, and how they compare with literature. Listening carefully to students' views is a means to identifying effective practices, and for addressing and removing barriers. Teachers may, or may not, have considered what *students* find useful or desirable, difficult or annoying when using these technologies for learning (Kinash, Brand & Mathew, 2012). What students tell us can contribute to desirable and effective outcomes for their own learning processes and progress (Katz & Aakhus, 2002; Niemiec & Ryan, 2009; Smyth, 2012). These aspects are of particular importance for school staff when designing effective learning programmes that will motivate and engage students, or in addressing and removing barriers to learning situations. Educators can use these findings to improve learning experiences for students, and the ways in which mobile technology and Web 2.0 tools are used can be more effective.

The findings in this study are significant in deepening our understanding of *how it is* for students within the social and learning contexts of the classroom. This study identified aspects of social and learning contexts, and the conditions within the classroom environment that are motivating and engaging for the learner. It also found aspects that had the opposite effect. Using such detail can positively affect learning contexts and conditions within the classroom setting.

This study is also significant for the research school's strategic planning. It has implications for staff professional development and budget considerations. Of great

importance is ensuring teachers receive professional development on the effective use of mobile technology and Web 2.0 tools in learning situations. While there is much innovation going on, educators are still grappling with transforming their pedagogy to include technologies (Luckin, 2012) and may need to extend their knowledge, skills and repertoire of teaching strategies that use mobile technology and Web 2.0 tools to support learning.

In addition, school management need to know where and how best to allocate funds in order to resource learning supported by mobile technology and Web 2.0 tools. Informed decisions need to be made around purchasing mobile devices that will be 'fit for purpose' in meeting curriculum goals and are suitable for the classroom setting.

It is significant in raising awareness and conversations among staff and parents regarding how we currently use technologies, how we might improve these experiences as a school community, and the importance placed on equipping its students with the knowledge and skills to function as digital citizens in the twenty-first century.

Research statement
The perception that mobile technology and Web 2.0 tools are motivating and engaging for students is widely held by educators, but on-going development and research is necessary (Luckin, 2012; Muir et al., 2006). Ryan and Deci (2002) tell us that for a student to be intrinsically motivated or have self-determination the social context or conditions must support learners' basic needs for autonomy, competence and relatedness; then learners are more likely to be motivated to learn. Although research indicates motivation and engagement are not synonymous, they are closely related. Motivation drives the learner towards engaging with learning (Ross, 2010), and engagement is students' *involvement* with activities and conditions likely to generate high-quality learning (Coates, 2008), therefore for the purpose of this thesis I intend to treat them as closely related - *as one leading to another.*

While there is an inherent motivation or self-determination in most of us, social contexts or conditions perpetuate or diminish it. If this is so, then what aspects of social contexts or conditions using mobile technology and Web 2.0 tools perpetuate or diminish motivation and therefore learner engagement? To make any kind of solid response to these queries, this study raises we need to actively seek students' voice and views on using mobile technology and Web 2.0 tools in learning situations. Students' voice and views will deepen our understanding of social learning contexts or conditions, which alone are complex, and what it is they find motivating and engaging about using these technologies, or if indeed they do.

Research questions

Using mobile technology and Web 2.0 tools to support learning is becoming more desirable and widely accessible. Educators need to know how students view and use these tools. The focus of this research is a small group of secondary students (n=7) at the research school and it aims to gather their voice and views on using mobile technology and Web 2.0 tools to support learning experiences. With this in mind the following research questions were proposed:

1. **Do students find it motivating and engaging using mobile devices or Web 2.0 tools in learning situations, and if so, why?**

2. **How do students perceive using mobile devices and Web 2.0 tools as influencing their learning?**

In order to understand how students perceive using mobile devices and Web 2.0 tools as influencing their learning we need to know how students perceive these devices, that is, how they view them, what their expectations are of them, how they interact with them, and how they relate to them.

1.2 Background and personal motivation for the study

As a classroom teacher at the chalk face of working with students it is part of my personal and professional practice to know as much as possible about my students in terms of their learning progress. It is also apt for a teacher to know how their students learn best and to personalise learning for them.

I was teaching Year 7-8 students when I received my first teacher laptop in 2004 as part of the TELA Laptops for Teachers Scheme, an initiative funded by the Ministry of Education in New Zealand.[1] There was a lot of excitement among educators at this time, and a lot of expectation on what the device would be able to 'do' in order to better prepare and equip teachers for teaching in the twenty-first century. Having my own teacher laptop became the catalyst whetting my appetite for learning that used technology as a way of motivating and engaging students. In many ways, the early days of technology in school saw a strong emphasis on the device and what it could do.

At that time, my classroom had a single desktop computer for 20 students. Our school had just purchased an HP Server with 40MB of storage and installed Internet data wiring. We had access to the Internet, and the service was sufficient as long as there were no more than twenty users online at once. We were wired, connected, and ready. With minimal infrastructure and a lot of enthusiasm, I believed technology could motivate and engage my students and transform my teaching and learning practice. How this transformation might take place and what it would entail were all uncertainties - but I was convinced it would not take too long. Reflecting back in a sober fashion, I realise there was far much more involved and the transformation was going to take time and effort. While the idea of using either a laptop or the Internet was new and exciting, the actualisation of it and time to explore its potential was limited during school hours. Initially, these technologies were for teacher administrative tasks including planning, gathering or creating resources, and emailing. Using technology became an integral part of my school and personal life - spending

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[1] The TELA Laptop Scheme (the TELA Scheme) enables eligible principals and teachers in New Zealand state and state-integrated schools to lease laptops. http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/Initiatives/ICTInSchools/ICTInitiativesAndProgrammes/LaptopsForTeachers.aspx

most evenings scouring the internet for resources, learning software programmes, and catching up on emails. Most staff in our school were novices to using a laptop and Internet technology, with only one staff member having owned a laptop, though several teachers owned a desktop computer, including the researcher.

The teacher laptop was not seen as a tool central to learning, nor a tool supportive to students' learning, but rather a handy but awkwardly placed artefact. During my nine years of using a teacher laptop there had been five school-wide Information and Communication Technology (ICT) professional development opportunities. The professional development involved staff learning a student management system (SMS) called MUSAC, a content learning management system (LMS) called Moodle, and an education cloud service offered by Google. Outside of this, there had been little to no school-initiated professional development for staff with a focus on pedagogy, or the usefulness of technologies for supporting learning. What did eventuate was personal research in order to understand this fast-paced evolving technology, and its potential use to support learning for students. Out of curiosity and necessity, my teacher laptop became a tool for fuelling personal research. I was convinced that using technology to support learning would motivate and engage my students in the same way I had been. This drive to know more has taken me on a learning journey - which has lead to this study.

The extent of use for my single desktop computer by students was similar to that of my experience with my TELA laptop, in that it was used in limited ways - like publishing students' work and as a reference tool. A good example of the effective use of technology in the *early days* was a New Zealand School Web Site Design competition my class entered. This project required a group of four students to design and build a website related to the New Zealand school curriculum and current learning topic. The experience entailed students' interactions, which are pertinent for effective use of mobile technology and Web 2.0 tools in learning today. It was authentic in that students created a website with an audience in mind and shared a message ('smoking is harmful to your health'). Students worked collaboratively in planning, problem solving, designing and constructing the website. It was an

experience that students involved themselves with using technology, and it was curriculum related. The learning was well planned and executed, and allotting time on the single desktop computer was the most challenging aspect. A considerable amount of time was spent in preparation and keeping ahead of students, which meant having to self-learn website building techniques, as well as a website building software programme, and then support students' efforts. What was obvious to me as the teacher was the motivation shown by students during their learning experience.

In 2007, I took up the position of ICT Administrator/Lead Teacher. The terms mobile technology or mobile learning were unheard of, at least not in my sphere of work, and have only recently in the last couple of years become more commonplace.

1.3 Overview of thesis

There are six chapters in this thesis. The first chapter introduces the study by stating its purpose, intent, and significance. It also provides background information about the researcher and research context. The second chapter reviews relevant literature on mobile technology and Web 2.0 tool use, motivating and engaging students, and students' voice in research. The third chapter describes the research methodology including the theoretical framework, research method, position of the researcher, significance of the research, data collection, data analysis, reliability and validity, and ethical considerations. The fourth chapter presents the findings in detail. The fifth chapter discusses the main outcomes from the Findings. Lastly, Chapter Six concludes the study by outlining recommendations for the research school and wider implications, limitations, and areas for further research.

1.4 Summary

This chapter has introduced the reader to the purpose and intent of the study, and presented the research questions. It has pointed out the significance of the study; identifying where its importance lies in supporting future learning for the research school, teachers and students. It has described the researcher's background, personal

interest in the research topic, and the context of the research. Lastly, it has provided an overview of the thesis.

The next chapter reviews relevant literature on mobile technology and Web 2.0 tool use, motivating and engaging students, and the importance of students' voice in research. The literature situates this research study in a broader context.

Chapter Two: Literature Review

This chapter provides a review of literature that is relevant to this study on the use of mobile technology and Web 2.0 for learning, and whether or not students find them motivating or engaging. The review provides definitions of mobile technology and Web 2.0 tools. It explores the unique ways young people relate to and use mobile technology and Web 2.0. It considers and discusses areas where mobile learning is effective, and Web 2.0 is useful. It looks at learner motivation and engagement, and *how* and *why* students might find it motivating or engaging using mobile technology or Web 2.0 tools in learning situations. It explains the implication of students' voice, and the significance of uncovering students' perspectives regarding mobile technology or Web 2.0 tools. Lastly, it discusses mobile learning in New Zealand.

2.1 Definitions

The concept of Web 2.0 as *harnessing collective intelligence* has remained reasonably constant, but the ways in which it is used has grown and developed over time (O'Reilly & Battelle, 2009). The notions around mobile technology, mobility, and mobile learning have grown in a relatively short time, which is probably due to new and emerging technologies challenging cultural norms or traditional ways of doing things. Marvin (1990) explains that through 'experience' we recognise what a particular phenomenon is, and what our relationship to it should be. When current and emerging technologies appear on the scene our bodies act like a probe making sense of it, coming to know its ways of usefulness until it becomes familiar. Marvin uses the telephone and electricity to illustrate the type of impact and transformation that takes place when new technologies are introduced and challenge existing structures and social processes of the individual, family, community and public. In the same way, mobile technology, mobility, and mobile learning are challenging the current and more traditional forms of education. These new technologies bring with them new structures and social processes for individuals, families, community and public. The more 'experiences' had with new technologies in an educational setting challenge the existing structures and practices, causing new practices to be forged.

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How we experience new technologies, and how we relate to them, help us to define them and their usefulness in our existential world.

2.1.1 Web 2.0

O'Reilly (2005) initially defined Web 2.0 as using the World Wide Web as a platform for web-based applications known as Web 2.0 tools which can be connected to from any device, anywhere in the world, and at any time. This includes both static devices and mobile devices. In connecting to these applications or software services, users become consumers and producers of data, and in so doing improve the service, which is referred to as 'architecture of participation'. A year later O'Reilly (2006) refined his definition of Web 2.0 to 'businesses' that use the internet as its platform, and developing understanding and practices around creating applications that build effective networks that continually improve as more people use them. McLoughlin and Lee (2007) define Web 2.0 as a personalised interactive online environment emphasizing "active participation, connectivity, collaboration and sharing of knowledge and ideas among users" (p. 665). Added to this, Oliver (2010) describes Web 2.0 tools as "the current generation of Internet applications that allow users to collaboratively generate their own content" (p. 50). In summing up the nature of Web 2.0, Anderson (2007) identifies overarching concepts of Web 2.0 as collaboration, contribution, and community, using technology.

For the purpose of this study, and synthesised from reviewed literature, Web 2.0 refers to the online community in which content is collaboratively created and shared, and Web 2.0 tools refers to the internet applications which allow users to collaboratively create and share content.

The manifestation of Web 2.0 is in the usefulness of its applications and services such as blogs, wikis, social network sites, multimedia sharing, social book marking and tagging, podcasting, Google maps, and others like it. A good example that encapsulates the original concept of Web 2.0 is Wikipedia (Wikipedia Contributors, 2009). Weinberger (2007) states "one of the lessons we can learn from Wikipedia is

that conversation improves expertise by exposing weaknesses, introducing new viewpoints, and pushing ideas into accessible form" (p.145). Weinberger shows this by drawing some interesting comparisons between Wikipedia and Britannica. On the one hand, Britannica information is from a reputable and credible source. The information comes filtered, packaged and predetermined for the reader. It is thought of as reliable due to its many scholarly authors, so the reader can merely trust it and is a passive recipient of the knowledge. In contrast, Wikipedia provides all metadata with articles contributed by anonymous authors, assumes that the reader will critically evaluate its content, and even edit or contribute to it. In this manner, Wikipedia treats readers as active participants in building knowledge. While Wikipedia chooses to focus on its many contributors and community, rather than credibility, they anticipate that credibility will come through its many users as they improve the service through using it. What we are seeing now through Web 2.0 is crowd sourcing and collaborative construction of knowledge. The notion of Web 2.0 signifies the importance and power of peoples' voice and contributions.

As technology continues to evolve, O'Reilly and Battelle (2009) inform us that the web is growing up to what is termed 'Web-Squared' which signifies the exponential growth and opportunity of the web 'where web meets the world'. It encompasses Web 2.0, and Web 3.0 or semantic web. O'Reilly and Battelle describe the web as heading towards 'harnessing collective intelligence' provided by human will, and also by sensors that gather sensory data from users as they carry out their day to day lives. They use the illustration of (collective) parents with a newborn baby, and as the baby grows it becomes more aware of how to interact with its surroundings. In a similar way, as we (collective parents) use the web (growing baby), providing it with vast amounts of data, it interacts in ways that are more intelligent. With its own philosophies of openness, collective intelligence and transparency, the goal is to bring the web into the world through mining vast amounts of data in real-time, and using this in tackling real-world problems.

2.1.2 Mobile technology

In seeking a definition for mobile technology, some authors wisely point out that while it can be defined in terms of its technologies or hardware, these can be restricting, and suggest an alternative way of defining mobile technology is from the perspective of those who use it. This can be complicated, as it can mean different things to different people, and used in different ways for different contexts (Brown, 2002; Kirkpatrick, 2008; Luckin, Bligh, Manches, Ainsworth, Crook & Noss, 2012; Traxler, 2009). Many earlier studies focused on technical aspects of mobile devices and their use (eg., Cheung & Hew, 2009). Evolving ideas about mobile technology saw the focus shift from technology to social practices that technology enabled, and centred on learning practices and context.

2.1.3 Mobility

Contexts are continuously created by the interactions taking place with people, surroundings and everyday tools enabled by mobile technology. Mobile technology takes on the role of connecting 'interactions' across formal and informal learning contexts, which gives rise to the term 'mobility'. Some deep and wide thinking has been done regarding context and mobility in: physical space, technology, conceptual space, social space, and learning dispersed over time (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sánchez & Vavoula, 2011; Sharples, Amedillo-Sanchez, Milrad, & Vavoula, 2009). Kakihara and Sorensen (2002) remark that the concept of mobility in our social lives is one of 'fluidity' which goes beyond people on the move, to the mobility of human interactions with others, and technology. Mobile technology enables effective, fluid working environments to be formed.

2.1.4 Mobile learning

Mobile learning is a concept difficult to define precisely. The term embodies several ideas that weave together the usefulness of mobile technology, learner needs, and contexts. From a pedagogical perspective Kearney, Schuck, Burden, and Aubusson (2012) identified authenticity, collaboration and personalisation as key features of mobile learning. Authenticity refers to contextualized, participatory, situated learning; collaboration points to conversations and connectedness; and personalization implies

agency, ownership and autonomy. Sharples et al. (2009) characterises mobile learning as "the processes (personal and public) of 'coming to know' through exploration and conversation across multiple contexts, amongst people and interactive technologies" (p. 237), and that conversation and context are central to integrating mobile learning into formal education as it takes learning "outside the classroom, into conversations and interactions of everyday life" (p. 237). For Traxler (2009) it is "essentially personal, contextual, and situated" (p. 30), and one of its defining characteristics will be "finding information rather than possessing it" (p. 34). In summing up, the term mobile learning in educational settings refers to learning conversations and interactions that take place across time and contexts using mobile technology.

2.1.5 Collaborative and cooperative learning

When either cooperative or collaborative learning are used, then teachers are tending to "make different assumptions about the nature and authority of knowledge" (Bruffee, 1995, p. 12). For defining collaborative and cooperative learning in this study, Bruffee (1995) offers some clear distinctions. Bruffee describes cooperative learning as used mainly with primary children for foundational learning (basic, beliefs we all agree on) for teaching them to work together, and for social integration. He describes collaborative learning as used mainly with adults and adolescents for non-foundational learning (where the authority of knowledge is questioned, and answers to questions require sound judgement). Cooperative groups assign different social roles, where as collaborative groups only social role is a recorder. Cooperative learning sees the teacher intervening in group work and ensures the smooth running of groups, where as collaborative learning sees the teacher seldom intervene in groups, and if the needs arises, then they turn the issue back to the group to resolve. Cooperative learning eliminates competitiveness among learners, where as collaborative learning encourages competitiveness amongst individuals in relation to reaching a consensus as a group, and encourages competition between groups. Cooperative learning requires accountability from students to the teacher, where as collaborative learning shifts the authority or control of the learning from the teacher to the student. Both types of learning teach the art of working *interdependently*.

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In further defining collaborative learning in relation to the teacher's role, Wiener (1986, p. 61) argues that "the effective collaborative learning teacher is one who understands the basis and structure of collaborative learning and who knows how to lead students to work productively within it." Weiner highlights important roles of the teacher as:

- (Task setter) the task and the teacher stimulates active learning in order for the group to reach a consensus (collective judgment) with authority;
- (Classroom manager) organising and implementing;
- (Role during group work) creating social structures for students to gain competence and take authority for their learning;
- (Synthesiser of knowledge) helping groups perceive similarities and differences and synthesising results of groups, then joining and comparing with knowledgeable, scholarly groups beyond the classroom.

Understanding collaborative teaching roles provides a context for students' learning, in this study.

Collaborative learning involves the types of interactions hoped for in mobile learning. The essence or power of collaborative learning is in individuals pooling or sharing their knowledge through constructive conversation (Bruffee, 1995) to produce, create, and improve knowledge, which we saw in the earlier example of Wikipedia (Wikipedia Contributors, 2009). Mobile technology and Web 2.0 are powerful enablers of collaborative learning (Ertmer et al., 2011; McLoughlin & Lee, 2008) as their features allow them to bridge learning contexts, communicate both asynchronously and synchronously, and enable the co-construction and sharing of content. Collaborative use is perhaps best described as social knowing, where the knowing is not the result of an individual's brain, but rather the result of learning conversations with others which can take place in the same room or from anywhere in the world in real time or asynchronously (Anderson, 2007; Weinberger, 2007).

2.2 Young people, mobile technology, and Web 2.0

Young people relate to and interact with mobile technology and Web 2.0 in ways that are unique to them. These unique interactions are relevant to this study in helping to identify practices or the thinking of young people, and how these might influence their use of mobile technology and Web 2.0 in learning situations. They also help us to understand how young people perceive technologies may influence their learning. Understanding how technologies have shaped the social and cultural constructs of young people is useful to this study, and may go some way to explaining why students may find mobile technology and Web 2.0 a natural extension of who they are in informal settings, rather than as a device for learning in formal settings (Kinash, Brand & Mathew, 2012).

Most young people today have a mobile device of some sort with which they communicate with friends, family or others. In one survey (Lenhart, 2012) on American teen use of mobile phones, 77% of young people aged between 12 and 17 years had a cell phone. It was also found that mobile phone texting was their dominant form of daily communication; surpassing voice calling, emailing, instant messaging, and face-to-face socializing outside of school. They averaged on 60 texts per day; older teen girls were the keenest, texting on average 100 per day. Another survey (Duggan & Rainie, 2012) on mobile phone activities showed that 77% of American adults aged between 18 and 29 years old (n=451) accessed the Internet from their phones. Interestingly, African Americans and Hispanic browsed the Internet most of the time by mobile phone. This was more than whites, and those with high levels of income and education. Smith (2012), in a similar survey, identified some reasons for this: mobile phones are convenient and always available; they are suited to people's usage habits; and mobile phones fill access gaps.

Mobile phones have become more than just communication tools. They have evolved to being personalized forms of identity through which we can manage and carry on with daily life. The mobile phone has become one of the most important devices to

young people. It is a powerful tool for creating one's individual identity, along with clothing styles and use of language. It helps young people make the transition from childhood to the young adult world. They use mobile phones to organise their daily lives, and to socialize with peers (Campbell & Park, 2008; Kasesniemi & Rautiainen, 2002; Srivastava, 2005). Young people even use mobile phones as a fashion object; they accessorize it both technically and physically according to their taste (Srivastava, 2005). Using a mobile phone, or similar technology, for all personalized and financial transactions, is set to be the way of the not too distant future; for example, banking, purchasing goods at a distance and on location, using public transport, as security devices, and receiving timely location specific information as in augmented reality (Srivastava, 2005). This notion of mobile technology as a seemingly seamless and natural part of a young person's life is important to this study as it seeks to understand the perceptions and experiences of students with mobile technology and Web 2.0, and how young people might perceive their usefulness in learning situations.

Project trials involving university students using smart phones found that ownership of devices was important, rather than using borrowed ones (Milrad & Spikol, 2007). Students were more likely to give time and money to personalizing them. In an Australian iPad trial (Brice, 2011) Year 5 and 6 school students were using iPad devices belonging to the school and had designated apps for learning. Students were encouraged to personalize the iPads by downloading apps, music and videos of their choice. Allowing students to set up and manage the devices was a significant change in thinking for the school, and personalizing the school devices was seen as a privilege.

Social relationships are built and maintained using mobile phones. In order to build social status young people 'show off' messages to one another, and the number of them. Text messages are a safe and private way of communicating among parties, and young people can text one another at any time of the day or night. Before mobile phones, communicating with peers after bedtime did not happen. Mobile phones allow children to increase their autonomy, and parents are not always aware of how their children are using them (Campbell & Park, 2008; Kasesniemi & Rautiainen,

2002; Srivastava, 2005). Srivastava (2005) points out that while mobile phones strengthen individuals' social networks, they can weaken the family-based structure. It was easier for parents to keep track on their child's friends or acquaintances when they came to the front door or they rang on a landline, but mobile phones have changed these practices and now parents are bypassed through SMS texting or conversations that go unnoticed. Scrivasta (2005) claims that this reshapes the family unit from 'oneness' to 'many-ness'. A positive however, is that while mobile phones are seen by some to fragment families, they can also provide external supports, for example, in domestic violence or child abuse situations.

Young people typically perceived having a mobile phone as having more autonomy. One study (Williams & Williams, 2005) involving 15-16 year old teens and their parents, showed that mobile phones have become a source for negotiations between young people and their parents. Parents were more willing to negotiate curfews and extend time limits on their teen's social activities, and in some instances removed them altogether. Teens did not mind having parents 'invading' their space (through calling or texting) if it meant they could have more autonomy. Understanding young people's strong desire for autonomy, and how mobile phones coupled with negotiating skills contributes to their autonomy is important to this study, and links with student autonomy as a key element for learner motivation (Ryan & Deci, 2000). This study looks closely at learner motivation and their need for autonomy, and how mobile technology and Web 2.0 might support this need.

Some studies have observed the unique ways young people share mobile technology. They share each others' mobile phones to make calls or send SMS messages, and they read each others' messages and share in composing responses. They collectively join conversations or circulate SMS messages that initially began on a friend's phone. Reasons for sharing mobile technology among young people can vary from economical costs, display of friendship and trust, borrowing and lending, out of curiosity, collaborating, and time filling (Kasesniemi & Rautiainen, 2002; Weilenmann & Larsson, 2002). For example, forms of sharing were taking turns with friends, borrowing and lending of phones with friends, and sharing (phone numbers)

with unknown people. Weilenmann and Larsson (2002) described a typical scene where a seemingly private conversation (a phone rings, and the owner implies it is for them) became a shared conversation (among peers within close range), and then became unintentionally a public conversation (as conversation took place in a public space). This sharing or collective use of mobile technology is a normal practice amongst most young people and is important to this study as it seeks to understand the practices considered normal to young people, and how these normal practices might influence young peoples' views or experiences in the research school.

Being always accessible by mobile phone is important to young people. They want to be communicative and accessible whether at school, home, or anywhere in the world, and they personalize public spaces (Campbell & Park, 2008). They want to be current within their social networks, and informed at any time. The convenience of texts is that they can cross barriers of *time* and *place* that phone calls may not be able to, or at least they would be unsuitable (Kasesniemi & Rautiainen, 2002). An example of this would be a child sending a text to a parent in a business meeting that the child would not dream of interrupting otherwise. Through mobile phones, users can create their own 'at-home' environment regardless of where they are physically situated (Srivastava, 2005; Williams & Williams, 2005). It is an experience frequently associated with cell phones and is generated by the ability of mobile phones to provide anywhere, anytime connectivity for those who want to stay connected at all times, and those who want to connect with someone anywhere, anytime (Decuypere, Masschelein, & Simons, 2012). Because mobile phones convey the impression of being always connected, they create the feeling of never being alone. Owners gain an emotional attachment with them and never leave home without them (Srivastava, 2005), which can have a downside that is discussed further on. This notion of being always accessible and always connected is useful to this study as it seeks to understand the context and conditions in which young people learn, and how they perceive them as impacting on their learning as they move between informal and formal contexts on a daily basis.

2.3 Effectiveness of mobile learning

Recent literature found that the focus for most research studies involving mobile technology and mobile learning was on its 'effectiveness' or 'usefulness' (Wu et al., 2012; Hung & Zhang, 2012). While mobile technology comes in forms driven by the demands of business and personal use, its usefulness for learning in a school setting or for solving problems in education has not been at the forefront of designers and manufacturers (Peters, 2007). However, *because* of its usefulness in the business world and social world, it is pervading the traditional boundaries of education, and is being increasingly used (Cheung & Hew, 2009). The patterns of usefulness will change quickly with mobile technology, as new emerging technologies with different features, apps and capabilities appear on the scene (Wu et al., 2012). Kinash, Brand and Mathew (2012) argue that mobile learning should be part of students' everyday learning because it helps students learn, and not because students in the twenty-first century demand it.

2.3.1 Ubiquity

One the most useful aspects of mobile learning and mobile technology is its ubiquity or its ability to connect students to the world or learning contexts outside of the classroom. Mobile learning bridges the gap between informal and formal learning. It allows learners to access knowledge and skills customised to fit needs and interests, wherever they need it, and whenever they need it (Kukulska-Hulme et al., 2011; Peters, 2007). Early on, Papert (1993) recognized that technology gave the child a world to explore beyond their immediate reach, and driven by their own interests through rich media computer enabled technologies. Today his partially fulfilled vision is seen in young people using technology to pursue personal and social interests that were classroom bound, but now accessible through mobile devices like iPads, iPods, and mobile phones (Johnson, Adams & Hayward, 2011). Evans (2008) study on the use of podcasts as a revision tool found that university students studying business preferred them to textbooks and valued the flexibility of listening to them while travelling. O'Reilly and Battelle (2009) share a similar but more contemporary

vision of ubiquity using Web 3.0 technologies, where the web is taken to the world through concepts like augmented reality, which they claim will become the new norm. The notion of ubiquity is useful to this study, which seeks students' views or experiences of learning that takes them beyond the context of the classroom to access knowledge to meet their learning needs and personal interests.

The relevance between school learning in a traditional sense and the real world is drifting further apart. Murray (2010) states a widening gap exists between everyday use of mobile technology and its use within the classroom setting. Some experts refer to it as the new 'digital divide' (Sharples et al., 2009; Waycott, Bennett, Kennedy, Dalgamo & Gray, 2010). Inside the formal educational setting it is slow to change; outside of the classroom the setting is informal, more social and fast changing. While mobile learning can bridge this gap, in some educational settings mobile technology faces restrictions and controls are tight (Sharples et al., 2007, p. 21). Educators need to find ways of closing this gap by understanding their students' interests and needs, and by viewing learning as continuously happening for them beyond the traditional boundaries of school, which includes physical, time, and conceptual constraints (Kukulska-Hulme, 2010; Sharples, Taylor & Vavoula, 2007, p. 23). The idea of being connected at all times for social purpose sits well with students, but being always connected for learning purposes is not as inviting (Waycott et al., 2010).

2.3.2 Intuitiveness

A study by Brice (2011) points out the ease with which young people pick up the intuitiveness of mobile devices and applications that make them relatively easy to use. Intuitiveness of devices and applications allows students to focus on using applications that build on their curiosity for learning, rather than having to learn or master software programmes. Kirkwood and Price (2005) state that any forms of new technologies that enable new ways of teaching and learning cannot *guarantee* effective learning outcomes and student achievement. This is also true for using any type of Web 2.0 tools (Burden & Atkinson, 2008). Well-planned learning activities have sound learning goals, and use appropriate pedagogy. Students also need skills

for using technologies and know why these are important to them.

2.3.3 Transforming pedagogy

The usefulness of mobile technology and Web 2.0 is a double-edged sword, on the one hand enriching and enabling learning to take place like never before, and on the other hand disrupting and challenging the traditional structures of education and pedagogy as we have known it (Traxler, 2009). Ehlers (2009) posits that mobile learning is more about the learner and learning, and less about the teacher and teaching. Ericsson (2012) predicts that transformational change in learning will be driven from the bottom up by students and innovative teachers as they bring a wealth of personal technology experience into schools. If this is so, then students should have a voice and an integral part in transformational change. Students' voice is important to the process of this study and is discussed further into the literature review (Section 2.6).

Literature acknowledges the need for a changed pedagogy (Cochrane & Bateman, 2008; Luckin, 2012; McLoughlin & Lee, 2008; McLoughlin & Lee, 2010). Currently, institutions and educators seek to harness the potential of mobile learning, but admittedly lack training, skills and support (Luckin et al., 2012). Peters (2007) identified limitations for adopting mobile technology for learning as teachers' age and skills, cost of devices and infrastructure, slow change rate in educational structures, and mobile devices designed for business not education. Luckin et al (2012) insist teachers need skills, support and training if they are to be confident users of technologies, and that a teacher's role will require them to become more like architects, designing contexts and activities that enable high-quality learning. Other studies agree that key features enabling teacher success in mobile learning were sound pedagogical decisions and design, clear learning goals (Motteram & Sharma, 2009; Murray, 2010; Narayan & Baglow, 2009) and significant pedagogical change (Murray, 2010). The role of the teacher has a major impact on mobile learning in a school setting, and how students perceive and experience it. This study aims to understand how teacher pedagogy affects the research participants' views and

experiences using mobile learning, and is interested in the rich description these young people are able to provide.

2.4 Facebook and other Web 2.0 tools

Educators aim to capitalize on the potential usefulness of familiar, popular, and preferred social spaces like Facebook to support learning goals and motivate young people. As a space designed for networking and communicating, it has potential as a space for educational conversations between teachers and students, with the aim of bolstering learning. There have been positive outcomes from using social spaces like Facebook for learning. In one study (Meishar-Tal, Kurtz, & Pieterse, 2012) contributing factors leading to the success of using Facebook as a learning management system (LMS) was having a well-designed task, quality and timely responses during the task, and the use of Facebook was a requirement and integral part of assessment. Some students perceived the dynamic learning environment as being intense, and a heavy load on their routine work, although a thorough orientation to the learning environment could have gone some way to addressing this. Anderson (2007) also shares a positive example of how a lecturer noted that his students, after viewing their learning tasks in a virtual learning environment (VLE), would then proceed to discuss the learning on Facebook. Since Facebook was their preferred space for discussion, the lecturer joined them there.

Web 2.0 use in a school setting has the potential to transform levels of learning from low to more sophisticated and deeper levels (Ehlers, 2009), but there are more instances of low-level use in schools, and the acknowledgement that there is need for further development (Clark et al., 2009; Luckin, 2012). Though students indicate they want to use Web 2.0 tools in formal settings, how this is enacted to ensure deeper-level learning experiences needs re-thinking, and further technological skill development and support for teachers (Clarke et al., 2009; Luckin, 2012). Cochrane and Bateman (2008) found that sound planning, appropriate pedagogical design, and technical support were necessary for successful mobile Web 2.0 learning.

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Tensions

Literature tells us of the conflicts between personal use of Web 2.0 and its use for learning in a school context. Web 2.0 tools have traditionally not been a part of the school setting, and as educators introduce these tools, a conflict of perceptions takes place. Students see schools, and therefore learning, as a setting governed by rules and scripts, and use Web 2.0 and its ubiquity to often circumvent the boundaries of school settings (Clark, Logan, Luckin, Mee & Oliver, 2009). According to Grant and Keisler (2002), social meanings drawn from particular settings impact on the way people relate to and interact with others in the setting. These settings have protocols or certain ways of doing things already scripted into them. There are cues within the settings that trigger behaviours and mental schemas of how things should work. These cues can be the physical environment and its rules or protocols, behaviour and dress standards, or even the technology used. When people enter the environment or setting they act according to what they know to be normal practices and expectations, and this adds to the identity of the setting. Most students learn to use Web 2.0 tools for personal and social reasons, with the support of peers outside of the school context (Rudd & Walker, 2010). Clark et al. (2009) found that young people have an innate conflict using Web 2.0 tools between informal and formal settings. Clarke claims that this may be because they use Web 2.0 tools regularly in informal settings for various purposes, but mainly to socialize (Clark et al., 2009).

There are further tensions with Web 2.0 use for learning. Some experts emphasize the idea that students find it motivating, as they become producers of knowledge rather than just consumers, while others argue that most learners are not interested in going through the motions of producing their own knowledge, and once the 'novelty' of new technology wears off it will lose its appeal (Anderson, 2007, p. 33). In fact, Anderson (2007) points out there is a need for in-depth understanding of students' learning mannerisms, the socialization that under girds Web 2.0, and the interaction that takes place between these. What is of significance to this study, are the experiences of Web 2.0 students have had, and the perceptions of Web 2.0 already formed upon arriving at school. Anderson (2007) calls for getting to know the minds and thinking of students who use these tools, which is the purpose and intent of this

study.

2.5 Motivating and engaging the learner

The terms motivating and engaging are similar, but they are not synonymous. Rich learning activities or situations are often referred to as motivating and engaging, which can give the impression they are the same thing. On the contrary, motivation can be seen as a driver for engaging students in learning (Ross, 2010), where as student engagement is "students' involvement with activities and conditions likely to generate high-quality learning" (Coates, 2008, p. 1). When a learner is motivated, they are moved to do something (Ryan & Deci, 2000) and engage by becoming occupied or involved with what they give their attention to (Axelson & Flick, 2010). Similarly, when the social context or conditions for learning are motivating, then learners engage themselves in the learning activity.

2.5.1 Motivation

While there are several theories used to understand motivation, Ryan and Deci's (2002) Self-Determination Theory (SDT) best fits within the notion of mobile learning and Web 2.0 and its perceived effect on motivating learners. Self-Determination Theory addresses the human need for *autonomy, competence* and *relatedness* (discussed in more detail further on), and is useful for this study which seeks to understand in what ways mobile learning and Web 2.0 are perceived as motivating learners, and therefore perceived as supporting their need for autonomy, competence and relatedness in learning situations. Ryan and Deci (2002) describe two components of SDT as *intrinsic* motivation and *extrinsic* motivation. The link between intrinsic and extrinsic motivation and this study is important for exploring the types of motivation students are experiencing when using mobile technology or Web 2.0 tools to support learning, if indeed they are motivated at all, and the social context or conditions that perpetuate or diminish these.

Ryan and Deci (2002) tell us that for a student to be intrinsically motivated or have self-determination, then the social context or conditions must support the learner's

needs for autonomy, competence and relatedness. If this is so, then what are some significant aspects of using mobile technology and Web 2.0 that support learners' needs for autonomy, competence and relatedness, and how to do students perceive these as being motivating? The perception that using mobile technology and Web 2.0 tools is motivating and engaging for learners is widely held by educators, but on-going development and research is needed (Luckin, 2012; Muir et al., 2006) which gives justification for this study.

Ryan and Deci (2000) describe intrinsic motivation as deriving from natural activity or curiosity, and when the social context or conditions meet the basic learner needs for autonomy, competence and relatedness then learners are more likely motivated to learn. The result of intrinsic motivation is high quality learning and creativity, which teachers or parents can hinder or accelerate. The authors (Ryan & Deci, 2000) describe extrinsic motivation as doing something for its instrumental value or to attain something separable from the activity, rather than the activity being personally enjoyable. Extrinsic motivation is supported or hampered by social contexts or conditions that seek to integrate its values and responsibilities. While there is an inherent motivation or self-determination in most of us, social contexts or conditions perpetuate or diminish it.

2.5.2 Learner autonomy

Ryan and Deci's (2002) Self-Determination Theory argues that the social context, or classroom conditions in which learning takes place must satisfy the learners need for autonomy, along with competence and relatedness. In some studies, the use of mobile technology and Web 2.0 tools supports learner autonomy. Chandra and Lloyd's (2008) mixed-methods study on the benefits of learning supported by technology, concurs with this idea when it found that what students enjoyed most of all was the opportunity to work independently (using technology) and be in control of their learning - which gave them more autonomy as a learner. Many of the students voiced their 'enjoyment' of learning this way and found it 'interesting'. Similarly, Evans (2008) podcast study, involving undergraduate students in higher education in an

online survey, showed that learners found them efficient, effective and engaging when using them as revision tools. Students had more control and flexibility over the learning, choosing when and where they would listen to podcasts. Ehlers (2009) argues that a new learning model giving learners more autonomy places an emphasis on participation, mutual construction of knowledge, and development of competences, and moves away from the predominant model of 'knowledge transfer' found in most educational learning contexts today. The use of Web 2.0 technologies and mobile technology supports this notion of participation, mutual construction of knowledge and development of competences. They support learning as a social process, whereby using different tools meet learners' needs for collaborating, communicating, constructing and sharing content. While these studies identified elements of learner autonomy as enjoyment, collaboration, control and flexibility, this study is aiming to gather rich description of the experiences students have had using mobile technology and Web 2.0 tools and what or how their need for autonomy has been supported by these.

2.5.3 Enhancing learner competence

Ryan and Deci (2000) note that for students to be motivated to learn they need to feel competent that they can succeed. If they clearly understand the learning goal, have the necessary skills, and receive relevant feedback, they should be more competent. Margaryan and Littlejohn (2008) state that while students, and teachers, may lack skills and basic competencies in using technologies, having these is an expectation for both teachers and students in the twenty-first century. They found that students use a limited range of technologies for learning and socializing, and mainly for recreation, social networking, and media sharing. The level of use and familiarity of collaborative tools for producing knowledge was very low. On the other hand, a study by Rudd and Walker (2010) found most young participants were confident users of Web 2.0 tools. Much of this confidence built up over time in informal settings and among peers. Skill development had taken place out side of school settings. In two similar studies (Copley, 2007; Evans, 2008), podcasts designed with the learner in mind, gave them quick access to important learning outcomes, main ideas and

important concepts. Students felt they were more likely to succeed because they were free from excessive detail, and not tied to other paper resources.

Earlier popular assumptions held by Prensky (2001) believed that students had grown up as 'digital natives' with technology, while their teachers on the other hand were 'digital immigrants', and that the gap between them was a digital divide which was a huge problem facing students and education today. Therefore, student's competencies using emerging technologies would be greater than those of their teachers, and teachers may not be able to competently teach students in a way required of twenty-first century education. A few years on, Waycott et al. (2010) conducted interviews and focus groups with three Australian university staff and students to find out their views and use of current and emerging technologies in their daily lives. The study concluded that educators' perceptions of this kind of 'digital natives' vs. 'digital immigrant' in learning situations may be misguided. They argue there are in fact more similarities than differences between students and teachers and their use of technology. Points of difference in their use were role and purpose related, rather than an age or generation gap. One study by Ertmer et al. (2011) involved pre-service teachers participating in international collaborations. Teams of students, including some from other parts of the world, investigated the usefulness of a specific Web 2.0 tool for learning and created Wiki chapters to share their findings. The findings from surveys and focus group interviews concluded that students actually do not like adopting technology for technology's sake, and want to know it has clear social or educational value before doing so.

These studies are useful for this study in demonstrating that learners bring with them into learning situations varying degrees of competencies and attitudes towards technology, having developed these over their lifetime from both formal and informal contexts. This suggests for a learner to have competence and to learn new skills related to the use of mobile technology and Web 2.0 they should be purposeful, add value and help to fulfil the learner's current role. This view of learner competency is important to this study, which seeks to understand in what ways students are using mobile technology and Web 2.0, and the competence they bring with them. It is

interested in the types of skills students possess or view as necessary for their learning, how they acquired them or might acquire them if they don't currently have them, and the impact of these on their motivation.

2.5.4 Learner Relatedness

Ryan and Deci's (2000) Self-Determination Theory explains that because extrinsically motivated behaviours do not cultivate a learner's natural curiosity, learners must therefore be externally prompted to take-on behaviours. In order for students to take-on or internalize behaviours they need to feel a sense of belonging or connectedness, or being valued. Ryan and Deci's Self-Determination Theory refers to this as *relatedness*. A study by Pohio and Falloon (2010) trialled a novel approach using mobile technology to enhance learner competence and motivation by communicating messages with parents using *real time* mobile phone calls, texts or video messaging that were positive and focused on students' achievements. They found using authentic feedback from people who meant a lot to them inspired students, and that attitudes, motivation and engagement improved through this. In Pohio and Falloon's (2010) study, the idea of learner relatedness moved beyond the context of the classroom and become even more personalised for learners. In a New Zealand case study involving first year online distance learning students, the way teachers related to distance students influenced their motivation to learn (Ross, 2010). In Ross's study, students indicated the need to be valued, accepted and to belong were of medium importance to their motivation to learn, and they wanted teachers to be caring, supportive, responsive and approachable. Students also noted autonomy and competency as highly important to their motivation to learn. The notion of relatedness is useful to this study as mobile technology and Web 2.0 affordances can provide a platform for social connectivity across contexts that support the types of relatedness necessary for learner motivation.

2.5.5 Engaging the learner

Student engagement is not easily defined, as there are different types of engagement.

According to Christenson, Reschly and Wylie (2012) reaching an agreement on a specific definition is neither desirable nor likely possible, and the differences add richness to the conversation on student engagement. Most scholars agree that engagement is multi-dimensional, comprising observable behaviour, internal cognition and emotion. Axelson and Flick (2010) give recent meanings of the term *engagement* as "to occupy the attention of" or "when we are entirely *present* and not somewhere else" (p. 40). Christenson, Reschly, and Wylie (2012) stress that scholars want to know even more about *how* student engagement works, and *when* it works to have an impact on student learning. This is also desirable for this study, which seeks to find out how mobile learning, and Web 2.0 might support student engagement.

The idea of mobile learning and Web 2.0 as emerging technologies supporting student engagement has a lot of promise surrounding it, and there are many good and engaging practices happening in schools (Luckin et al., 2012). Understanding and observing students' interactions while using mobile technology and Web 2.0 may provide good indicators of how well students are engaging, that is, what they have occupied or involved themselves in. When referring to interactions, we are looking at the interactions of the learner with people, their surroundings, everyday tools, and across learning contexts (Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sánchez & Vavoula, 2011; Sharples et al., 2009). For instance, in Evans (2008) study, university business students believed that mobile learning and using podcasts had enhanced their learning. Results suggested that when learners listened to podcasts they were engaged. The types of interactions students involve themselves in while using mobile technology and Web 2.0 tools are important to this study by allowing us to see *what* students engage with, and *how* they engage.

In many institutions, the potential of mobile technology and Web 2.0 as enablers of collaborative learning is still not yet fully recognized (Ehlers, 2009; Grosseck, 2009; Luckin, 2012), and learners use them in a cooperative manner (Vaughn, Nickle, Silovs, & Zimmer, 2011) or as replacement technologies (Cheung & Hew, 2009). Murray and Olcese (2011) argue that while iPads as a mobile device have the potential for collaborative use built into their design, more often than not teachers

continue to use them in traditional models of teaching and learning. While early popularity of the iPad centred on vast numbers of available apps, many of these were designed for consumption of content, rather than production of content. In Fitzsimmons (2011) observations of Year 3 and 6 students using iPads, educators tended to impose mobile technology on existing pedagogies, with the expectation of seeing benefits or improvements to students' learning. There were no significant improvements using the iPads in this way, but there were signs that teacher talk and student engagement could profit from their use. The Fitzsimmons (2011) study did highlight the need to re-examine pedagogy, and the potential of mobile learning to transform pedagogies. Interestingly, Radloff's (2011) survey of university students in New Zealand showed that collaborative learning was scarcely included in their experiences. They did not often work with other students during class, or outside of class, and the likeliness of this increased only slightly for them during their time at university. Although undertaken at tertiary level, such studies inform this current study by suggesting that student engagement through collaborative learning that is supported by mobile technology and Web 2.0 is a 'work in process', and justification for this research.

Working collaboratively can be a vehicle for shifting the authority, power and control of information from the educator or institution, to students as users. Weinberger (2007) shares that the content and organisation of knowledge is becoming a social act, and actors are writing the scripts. For traditional business, this means disseminating once held authority, power and control from the organisation to their customers as users, or risk losing them. In much the same way, mobile technology and Web 2.0 are 'rattling the cage' of traditional modes of learning, where the teacher is central and in control of content and organisation of information.

Through concentrated efforts to transform learning through changed pedagogy, close monitoring and on-going developments, there have been some good instances and outcomes integrating mobile technology. Cochrane and Bateman (2009) provide a good example of transformed learning outlining a shift from traditional face-to-face learning by integrating Web 2.0 tools and wireless mobile devices to support learning

and engage students in a social constructivist-learning environment. Cochrane and Bateman suggest that it is in the 'generating of content' that students became deeply involved or personally engaged, and work collaboratively with the 'technology steward' and other students. They also point out that in order to ensure successful integration of Web 2.0 it needed to be part of the learning criteria and assessment. This type of social constructivist learning environment enabled student centred learning with a focus on end-user content creation and sharing. Vaughn, et al. (2011) identified task design as important to collaborative learning, but they go a step further by stating it is necessary for the educator to model collaborative learning behaviours, critical conversations, and appropriate use of Web 2.0 technologies for students in the hope of cultivating the true essence of collaborative learning.

The idea that mobile and Web 2.0 technologies have the potential to transform learning from co-operative to collaborative types, where students engage with generating content both personally and collaboratively (Cochrane & Bateman, 2009) is useful for this study. The role of the teacher, task design and integrated assessment practices is also useful (Cochrane & Bateman, 2009; Vaughn, et al., 2011). The many trials and projects that are collaborative in nature and supported by mobile technology and Web 2.0, and which are being conducted in education settings (Cochrane, 2008; Fitzsimmons, 2011) suggests the need for on-going research and is also justification for this study.

2.6 Students' voice

Robinson and Taylor (2007) point out good reasons why educational research should involve gathering students' voice. For students, it is about increasing their rights as consumers, to have the right to express their views, to be heard, to be able take part in decisions that impact on them personally, to personalize students' learning and improve schooling conditions for them. Teachers are increasingly seeing the benefits of consulting with students on learning that affects them directly. From their theorizing on students' voice, Robinson and Taylor (2007) identify four core values of students' voice work. First, the idea that students' voice begins with

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'communication as dialogue' between teacher and student in order to forge shared meanings, rather than a teacher to student, or student to teacher, form of communication. Second, ensuring 'participation and inclusivity' by thinking about who they listen to (only students with cultural capital, or favoured students?), how they listen to them (just a form of tokenism?), and what they listen to students about (is it what teachers want to hear?). Third, recognising that power relations exist within school structures, they are unequal and problematic, and that students' voice challenges those power relation structures. Lastly, the pinnacle of students' voice work is 'transformation' that is, what we do with what we hear and understand from students, in order to bring about necessary change because of consulting together.

Smyth (2012) argues that if things are going to improve for learners, despite many educational reform efforts, then it is necessary to start including young people and their lived experiences and aspirations in approaches to policy making. He states that:

> Research that starts out from the perspectives of actively and
> authentically listening to the lives, experiences and aspirations of
> young people and what works for them inside the learning process,
> has within it the scope to uncover the impediments, barriers and
> constraints that turn young people off school in droves. (Smyth, 2012,
> p. 3)

The way this can be accomplished is through actively listening to what young people have to say, involving them throughout the process, and not muffling their voice with predetermined ideas that are disconnected or have little relevance to their daily lives. This is especially significant for disadvantaged students who come from low socio-economic areas and who drop out of school early. For example, in 2010, in the State of Victoria, Australia, 47% of males from low socio-economic backgrounds completed Year 12; where as 76% of males from high socio-economic areas completed Year 12 (Australian Curriculum, Assessment and Reporting Authority, 2012). In effort to address this, Smyth (2012) urges educators to start listening to students and that making students' voice an integral part of educational research

should become the norm.

Students and adults have different perspectives of technology, as was highlighted in a recent study by Kinash, Brand and Mathew (2012). While adult teachers tend to look at technology as being extra-ordinary, students in the twenty-first century who have been raised with technology view it as something normal, and which has always existed in their world to varying degrees. The study by Kinash et al. found that students were neutral about their experience using Blackboard Mobile Learn and iPads, and did not perceive the devices as having made a difference to their learning. However, they did acknowledge that using iPads increased their motivation. Students found that different devices or tools better served different purposes, and used tools for things other than learning. Perceptions of mobile technology use can be different between students and teachers, and therefore more research involving conversations with students is needed to better understand how they perceive and relate to the different devices, and what value they place on devices in terms of supporting their learning. This study aims to have such conversations in order to uncover students' perceptions.

Another study (Murray, 2010) conducted in an Australian school demonstrates the importance of students' perspectives and the importance of building discourse between researcher and research participants. Murray's study investigated the potential of the video iPod to engage and stimulate learning across the curriculum, and to improve teachers' use of ICT in the classroom. A class of Year 8 students from Heathmont College in Victoria were chosen as a typical school and provided with infrastructure, hardware, technical support and training for teachers. Students received hand-held mobile technology in the form of an iPod from which they could access digital podcasts at school or home. A virtual learning environment (VLE) and a content management system (CMS) became a repository for the digital curriculum content. Teachers reported that their pedagogy had changed, becoming more refined in using ICT for learning. They noticed increased motivation and improvement in student behaviour. In Murray's (2010) study, there were also claims by teachers that students were ahead of their peers in all curriculum areas of learning, just having

covered it differently. However, students had a different view of things and felt they were not achieving as well as their peers, mainly due to having to learn differently. Students also felt the work was harder as they had to think differently, and this put stress on them. Though Murray's (2010) findings seem at odds with the direction of this study, it serves to highlight the differences in perceptions and the implications for research that tends to rely heavily on just the voice of 'experts'.

With regard to current and emerging technologies, young people, technology and socialization will be where much of the activity will take place (Sharples, 2008), therefore we need to know what they are doing, how they are doing it, and why they are doing it, and we should be taking note of students' perspectives. Institutions and educators would do well to work closely with their students, making their voice an integral part of any type of research, reform or improvement (Robinson & Taylor, 2007; Smyth, 2012). For example, in a study by Tunnard and Sharp (2009) students voiced the personal importance of working with *friends* in collaborative situations, and that this factor can have an affect on the quality of learning, which include the quality of task related conversation and thinking, as well as the relationships within the class. The authors found that although collaborative learning assisted with learning new ideas, students felt they did not produce their best work in this way. Therefore, gathering the students' voice, rather than the expert voice of teachers is pertinent to this study. What students from the research school can tell us about their experiences using mobile technology and Web 2.0 tools may give us rich description and insights that may be overlooked, or not even considered by their teachers, who are seen as the 'experts'.

There is a need for more interpretive types of research that are based on students' voice, aim at understanding the heart of the learner by viewing and interpreting the world through their eyes, and together come to new understandings. The type of research needed to uncover the subtleties and nuances unique to young people as they live out their daily lives is one where the researcher works closely with participants, and has opportunities for rich conversation and observing their daily routine.

2.7 Mobile learning and Web 2.0 in New Zealand

In New Zealand, mobile learning is becoming a serious contender within more traditional structures of education. This is evident with the many research studies, trials, projects and initiatives going on (eg., Cochrane & Bateman, 2008). The Ministry of Education (2007) aspires toward a healthy vision for learners in New Zealand, seeing them as entrepreneurial, reasoned opportunists, cultural contributors (and not just consumers), and equipped and pro-active participants in life. Learning supported by mobile technology and Web 2.0 tools easily subscribes to The New Zealand School Curriculum (Ministry of Education, 2007) and its key competencies: thinking, relating to others, understanding texts and symbols, managing self, and participating and contributing. The key competencies are what people use "to live, learn, work, and contribute as active members of their communities" (Ministry of Education, 2007, p. 12-13) and the use of mobile technology and Web 2.0 tools can contribute to the development of these competencies. This is useful to this study which is interested in finding out how mobile technology and Web 2.0 tools are used or experienced on a daily basis by secondary students as they participate in life, and how their ways of usefulness are perceived by learners in a local context.

2.8 Summary

This review has highlighted themes found in the literature. Notable themes emerged regarding young people and their use of mobile technology and Web 2.0 tools. Young people have uses that are unique to them, and they do not necessarily view current and emerging technologies with the same fascination that educators might. Young people have informal skills and competencies, and transfer these skills into formal settings to varying degrees, and while they have grown up *with* technologies, they still look to the teacher as 'expert'. For young people to be motivated and engage with learning their needs for autonomy, competence and relatedness must be met. The form and function of mobile technology and Web 2.0 tools are able to support learners' needs for autonomy, competence and relatedness. Undergirding this study is the notion that learning can improve if students' perspectives and experiences are

integral to the research.

The emerging themes on mobile technology and Web 2.0 were based on its effectiveness to support learning, or its *ways of usefulness* for learning. Mobile technology and Web 2.0 enables learning to take place both informally and formally beyond the physical, geographical, contextual, and social and time constraints of the traditional classroom. Successful use of mobile technology and Web 2.0 that supports learning have the following features: sound pedagogical decisions and design; clear learning goals; and that it be an integral part of assessment.

Wu et al (2012) found that surveys and experiments were the predominant methods used to research mobile learning, and that quantitative approaches were preferred to qualitative approaches. Smyth (2012) argues that if we want to see learning improve for young people then research that clearly represents students' voice is necessary, and educationalists should start listening to students. Making students' voice an integral part of educational research should become the norm. This study differs from many mobile learning studies which employ more quantitative or mixed methods approaches (Wu et al., 2012) and aims to uncover the *how* and *what* aspects of perceived learner motivation and engagement supported by mobile technology and Web 2.0 use through qualitative approaches that seek the perspective of students. The reviewed literature is useful to this study as it highlights students' use of current and emerging technologies in learning situations. It has been difficult to find research from the *perspective* of secondary students within a New Zealand context, so this study will contribute in some way to help fill the gap. The next chapter describes the study methodology, and they way it was carried out.

Chapter Three: Methodology

This chapter introduces the methodology of this study. It presents the theoretical framework that informs the study, and discusses the interpretive paradigm, qualitative methodology and case study approach. It describes the data collection methods employed, semi-structured interviews and participant observations, and the data analysis procedures - transcribing, coding, and analysing. It explains practitioner research as an approach used for this study. It outlines the measures given to ensure reliability and validity, including the triangulation of data. Information is provided about the research context, which includes a description of the participants and how they were selected, the research site, and how access was gained. It also details the ethical considerations and how these were addressed.

3.1 Theoretical Framework

Research is conducted to make sense of our world, and how we make sense of it depends largely on how we view it. An early method and some argue the main method of explaining both natural and social phenomena was *the scientific method*. Coming from a 16-17th century backdrop of myths, legends and religious superstitions, scientists - known as natural philosophers at that time, started to demand *proof* as a basis for intellectual, moral and social life or phenomena. This proof was found through the method of science and what could be observed. General laws were derived from these observations and accumulated facts. The goal was *science* would help improve the world. So the successes of science in the natural world to solve problems, and gain better understandings, became the catalyst for using science to solve problems and understanding the *human* world (Tolich & Davidson, 2011). Up until the second half of the nineteenth century the method of science, or *scientific method*, continued to be the main method of explaining both natural phenomena, and human phenomena. Social scientists grew disgruntled with this method. They argued that natural science methods and principles were insufficient, and there was need for more qualitative methodologies for studying complex human phenomena. From the mid-nineteenth century onward, multiple

theories on existence and reality (ontology) and the nature of knowledge (epistemology) made way for new approaches to gaining knowledge (methodology). As a way of distinguishing these theories the concept of paradigms or theoretical frameworks was constructed (Cohen, Manion & Morrison, 2011; Tolich & Davidson, 2011). Making sense of social phenomena requires a theoretical framework to structure and support the research. The theoretical framework for this research is located within an interpretive paradigm.

3.1.1 Paradigms

A paradigm is like a lens through which we view the world. It influences our beliefs about existence and reality, and guides our thoughts and actions. In social science, paradigms are accepted [descriptive] practices and procedures used within disciplines during specific periods in history. Different eras of science are known for their worldview or paradigm, and their problem solving or explanatory powers. When a prevailing paradigm is challenged, by changing some of its underlying theory and methods and extending our depth and breadth of understanding, a paradigm shift takes place (Hart, 2002, p.126). Indeed, the concept of paradigms, and their rapid growth in social sciences, has become far more complex as they are used to look at the lives, experiences and knowledge production of diverse groups represented in society, for example, ethnicity, gender, and sexual orientation (Donmoyer, 2006). While there are numerous existing and ensuing paradigms - a result of researching complex human phenomena, some more common ones are: positivist and post-positivist; interpretive; constructive; transformative; pragmatic; critical and emancipatory.

3.1.2 Interpretive and positivist paradigms in education

The interpretive paradigm assumes that individuals seek to understand the world in which they carry out their daily routine life. What sets an interpretive paradigm apart from other paradigms is that it aims to understand and interpret the cultural or social context of 'others' by seeing the world through their eyes, or by walking in their

shoes. This means that truth or reality belongs to them, and exists within their lived world. The goal of the interpretive researcher is to gain knowledge and understanding of the individual's world by interpreting it together, and by spending time in their natural setting (Burns, 200; Cohen, Manion & Morrison, 2000; Taylor & Medina, 2013). This is achieved through a systematic collection and analysis of accurately interpreted meanings of individuals that have been shared and co-constructed in the natural setting. As a result, conclusions or theories are generated (Neuman, 2011, p.102). In educational research, the interpretive paradigm enables teachers as researchers to gain deeper understandings of the learning world experienced by students, and both the classroom and school cultures (Taylor & Medina, 2013). However, the interpretive paradigm has strengths and limitations.

The strengths of research embedded within the interpretive paradigm are that it views social research, that is, researching people and their institutions, as different to researching the natural sciences. In general, it seeks to understand the lived experiences of participants. Likewise, it produces knowledge of a particular situation, or contextual knowledge. Moreover, it emphasizes the importance of context in accurately interpreting the data (Bryman, 2008; Cohen, Manion & Morrison, 2000; Willis, 2007).

One of the perceived limitations of interpretive research is that the knowledge is subjective and open to researcher bias. Procedures for ensuring quality research are seen as far removed from scientific procedures. Some argue findings cannot be generalised, so the research does not contribute to scientific development (Cohen, Manion & Morrison, 2009). While these may be seen as weaknesses from a scientific viewpoint, some social scientists see them as necessary points of difference. Indeed, alternative criteria are used for ensuring research quality, and meanings of generalisability. In educational research, because the focus is on students and understanding their learning experience and environment, a different research logic is needed to that of natural sciences. In fact, an interpretive paradigm emphasizes studying people is different from studying natural phenomena, and that people themselves are different (Cohen, Manion & Morrison, 2000, p. 5).

In comparison, the positivist paradigm is at the other end of the 'continuum' to the interpretive paradigm. The positivist paradigm holds to the assumption that both the natural and social world can be studied in the same way. Moreover, knowledge is discovered and verified through observing and measuring phenomena. The phenomenon is treated objectively as something 'out there' and is deconstructed in order to establish facts. Furthermore, data must be valid and reliable, and able to be generalised to wider populations (Cohen, Manion & Morrison, 2011). The researcher remains objective to the research setting and controls the research process (Taylor & Medina, 2013). Positivist oriented research generally uses quantitative methods, which some argue may disregard context when making general statements about phenomena (Bryman, 2008; Willis, 2007).

The purpose, focus and goals of this study will influence how I will look at knowledge and how I will interpret it. Furthermore, they will set the data collection and analysis preferences, related vocabularies, research styles, writing styles and expectations for the research study (Silverman, 2011). The purpose of this study is to understand the views or beliefs, and lived experiences of school students using mobile technology and Web 2.0 tools to support their learning in their natural setting. Therefore, I believe an interpretive paradigm is the most suited. Certainly, the intent of my research is to see what students are seeing, and feel what they are feeling. I believe an interpretive paradigm is best suited to my research, as it would provide accurate data about the use of mobile technology and Web 2.0 tools by students in the research school.

3.1.3 Qualitative research

Qualitative research is an overarching term that encapsulates research methodologies and methods aimed at understanding social phenomena in its natural environment. The key assumption of qualitative research is that "reality is constructed by individuals interacting with their social worlds" (Merriam, 1998, p. 6). The common characteristics found in qualitative research include understanding phenomena and

interpreting it from the participant's perspective. The researcher works in the field collecting and analysing the data. An inductive strategy is used to build theory from the data. The product of research is rich, detailed and descriptive (Merriam, 1998). Certainly, qualitative research places an emphasis on words, and uncovers meaning embedded in language, which provides insight of the social phenomena. The words, once gathered, negotiated, interpreted, and analysed, provide a basis for informing the research topic (Bryman, 2007; Tolich & Davidson, 2011). Qualitative research relies on methods such as interviews and observations. These methods share the objective of an interpretive paradigm, by capturing the participants' voices and encouraging researcher and participant interaction. The types of studies that use qualitative methods for data collection are Case Studies, Ethnographic Research, Action Research, and Historical Research (Burns, 2000).

I believe a qualitative Case Study is best suited to capture the 'lived reality' or 'experienced world' of the individuals in this study. It focuses on the 'voice' of participants and their lived reality. In this study, the voice of students and their 'lived reality' using mobile technology and Web 2.0 tools for learning is paramount.

3.2 Case Study

The qualitative case study sits well within an interpretive paradigm (Cohen, et al., 2000,). A case study is defined as a study that looks in-depth at the development of a single unit, whether people or community, and has set boundaries. Looking in-depth provides a rich and full description of the unit or phenomena. The development of a unit is viewed as unit-related events that occur over time, and when viewed as a whole, comprise the case. A case study also looks closely at context. The boundaries set determine the unit of study, *the case,* and the context of the case, *the casing* (Flyvbjerg, 2011). Merriam (1998) describes it as fencing in what will be studied.

Merriam (1998) further defines qualitative case studies as being particularistic, descriptive and heuristic. For instance, a case study used in an educational setting is particularistic in that it focuses on a small group, their views or beliefs and

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experiences, what these reveal, and how the findings can help improve learning opportunities. It is descriptive, in that the end product of the research is rich, full description of the phenomena, including relationships, interactions and processes within the natural setting. It is heuristic, in that it provides insights of the case study in terms of what, how, and why.

Certainly, the case study is the most suited method for accessing students' thoughts, feelings and attitudes, how they perceive things happening, and for closely observing the natural setting. Moreover, it takes the researcher right inside their world and lets the researcher see and experience it from the inside out. The challenge for the researcher is to ensure every minute detail is captured and interpreted accurately. Capturing students' thoughts, feelings and attitudes toward learning is essential, amongst other things. Indeed, they will provide critical knowledge and explanations as to how or why things are the way they are, and make recommendations on how to improve learning experiences and outcomes for the students. In this qualitative case study, the unit of analysis is a small group (n=7) of secondary students. The casing, or bounded context, are the participants' views or beliefs, and experiences using mobile technology and Web 2.0 tools. This research uses a case study as the 'best-fit' approach to collect data to respond to the research questions.

Intrinsic case study
The type of case study used depends on the purpose of the research. More commonly they are used to discover information or gain a deeper understanding, that is, to describe, explain, explore or compare a case. Less often, they have been used to test theory, that is, explain, illustrate or experiment (Denscombe, 2007). An intrinsic type of case study, which is best suited to this study, is used when there is a natural interest in a case, and in order to better understand it. It is used 'when there is a need to learn about that particular case'. It is not used with the intent of being representative of other cases, nor for gaining a general understanding of a phenomenon (Stake, 1995, p. 3). This does not mean however that it cannot be generalised.

While this case study is intrinsic and localized, how far the findings can be generalised depends on similarities it may share with other schools (Denscombe, 2007). For this reason, significant detail needs to be included about the student participants and features of the school so that schools with similar features can make comparisons. However, the intent of this study does not include testing or producing new theory, or identifying problems, but rather to illuminate held beliefs or views, and experiences of students.

Limitations

There are common limitations or criticisms of the case study that need addressing. Chiefly, is the credibility of how far a case study's findings can be generalised across a population or group. Denscombe (2007) argues that a case study can be generalised as a 'particular and ordinary' example of situations that can be found elsewhere in the world, and how far findings from the case study can be generalised to other situations of its type depends on shared similarities and peculiarities. When reporting on a case study, providing sufficient detail on how the case compares with others of similar situations enables the reader to draw conclusions and make informed decisions as to its relevance to other situations.

Another limitation is that case studies are perceived as producing 'soft' descriptive data and not 'hard' quantitative measurable data. This can be addressed by ensuring the approach is rigorous and detailed (Denscombe, 2007). In other words, the procedures that were used to ensure methods were reliable and that drawn conclusions are valid and made explicit to the reader (Silverman, 2011). With this in mind, I have been transparent and explicit about what was done in data collection and data analysis. I have also attempted to use clear language so that the reader can understand the processes.

The presence of the researcher is known to effect participant behaviour (the observer effect), and participants may not be their natural selves (Denscombe, 2007). One way

this can be addressed is to spend time in the natural setting so that participants get used to the researcher being present. In an educational setting, the teacher 'as researcher' is already known to the participants and therefore is a familiar sight within the setting. This inside positioning of the researcher will likely lessen 'the observer effect' where participants could become embarrassed, defensive or portray themselves as something else when being observed. While gaining access to participants and research site can be limiting in case studies, in an educational setting where the researcher is part of the research context as an 'insider' researcher, access may not be so limiting. Still, proper procedures need to be used and formalised to maintain ethical and quality research (see section 3.). Ethical considerations and approval, ensuring 'no harm' to participants, and issues of anonymity and confidentiality need to be addressed.

When deciding on using a case study as the best approach I was aware that the findings would be 'particular and ordinary' to our students and school. It is intrinsically interesting in that it seeks to understand students' use of mobile technology and Web 2.0 tools, what is happening in the natural setting, and how things can be improved for our students at the school of which I am a staff member. The findings may also be useful to other schools with similar features. After considering the different uses of a case study, I decided to use a *descriptive* case study, which seeks to describe what is happening in a case study setting. Rich description of what is happening in the learning environment from students' own voice and observations provides data that is relevant to respond to the research questions.

3.3 Practitioner research

Practitioner research has been employed as a way of describing the role of the researcher in this study. Mentor, Elliot, Hulme, Lewin and Lowden (2011, p. 3) define practitioner research in education as a "systematic enquiry in an educational setting carried out by someone working in that setting, the outcomes of which are shared with other practitioners". Keeping within this definition, research is carried out

by the teacher 'as researcher' on an aspect of professional practice within their work setting. The teacher conducts an inquiry in a systematic way that can be considered research. This is done with the view of understanding students' experienced-world, class culture and school culture (Taylor & Medina, 2013). The aim is to improve one's own practice through the new knowledge gained, and sharing the benefits with other professionals.

While practitioner research is not something that is compulsory among educational professionals, it is known to provide a systematic and sustainable framework for change. It has relevance to the questions teachers as researchers ask. It also provides both 'space and voice' to improving learning experiences and outcomes for students, and the knowledge gained is relevant to that particular context (Mentor et al., 2011; Saunders, 2007). Smyth (2012) argues that if learning is to improve for young people then students' voice should be an integral part of research. Teachers are ideally positioned to be able to capture students' voice as part of practitioner research.

Practitioner research positions the teacher in a dual role where the teacher is also the researcher. A complex issue in dual role research is objectivity, and conducting unbiased research. Bias can take place at any stage of the research process. It can distort the reality of what is being researched and analysed, and should therefore be minimized. However, qualitative research of this kind cannot be altogether 'value-free'. So in order to minimize bias, the researcher needs to make explicit the 'guiding values' of their research. In doing so, the participants and the reader can decide for themselves how valuable and trustworthy the research is (Mentor et al., 2011).

3.4 Purpose

The primary purpose of this study is to deepen our understanding of *how it is* for students using mobile technology and Web 2.0 tools to support learning at the research school, whether they find them motivating or not, and using this information to ensure learning supported with these technologies is effective. By illuminating or uncovering students' views or beliefs, and experiences using mobile technology and

Web 2.0 tools, teachers may be able to use this information to transform their pedagogy, and plan more effective uses of these technologies to support learning programmes in their classroom. Uncovering students' views of their experiences can identify strengths and barriers to using mobile technology and Web 2.0 to support learning programmes, and capitalize on their strengths and address identified barriers that hinder effective use. It may also give teachers a better view of the existing class practices relating to these technologies, that is, in what ways they are being used to promote learning. In understanding the views of students regarding Web 2.0 tool use, better decisions can be made about specific mobile devices and Web 2.0 tools, and whether they fit a particular purpose for learning or not.

At a school management level, this study is significant for the school's strategic planning in regards to staff professional development and the allocation of funds in order to meet the learning needs of the students. It is important for making informed decisions when purchasing mobile devices and deploying them into classrooms, and also as the school makes plans to implement a Bring Your Own Device (BYOD) scheme in order to get a device into the hands of every student.

From a school-wide perspective, it is significant in raising awareness of the importance or value we place on the use of mobile technology and Web 2.0 tools to support learning and learners in the twenty-first century.

3.5 Context of research

In many ways the research school could be well situated in a 'developing country' with its financial struggles to deliver quality infrastructure, professional development and school policies to guide and support the integration of information and communication technologies and all that it encompasses (see Table 1).

Table 1: Profile of Research School

Description	Number
Roll	184
Decile rating	3
Girls	45%
Boys	55%
Maori	53%
NZ European/Pakeha	43%
Asian	2%
Pacific	2%

Note. Source ERO Report, 2012

Students from the research school were chosen based on gender, ethnicity, and year level. Technology challenges that have affected the research school have been the archaic infrastructure comprising a 10 year old server, slow Internet connection, inadequate wireless connectivity, and limited funds to do much about it. These challenges are being addressed this year (2012) with a server upgrade paid for by the school, new data wiring through the Ministry of Education (MOE) School Network Upgrade Project (SNUP), and faster Internet connectivity through the Ultra Fast Broadband rollout also provided by the MOE. It is intended that these will improve students' access to Internet data. It should be noted here that the school is moderately equipped with technologies including mobile devices such as laptops and iPads (see Table 2). Teachers prefer students using laptops and iPads, with only a few desktops remaining in classrooms. The school is planning to lease more mobile devices in the near future.

Table 2: Devices in the Research School

Devices	Secondary	Primary
Laptops	30	12
iPads	10	0
Desktops	5	4
Projectors	6	4

Professional challenges have been a lack of vision and leadership regarding eLearning. However, plans are underway for school-wide ICT professional development in 2013. In terms of teachers at the school using mobile technology and Web 2.0 tools in students' learning experiences, this has been left to the individual. The depth or level of use of technologies by teachers to support learning would best be described as *replacement.* Teachers use technologies to replace old technologies, for example, PowerPoint and projectors replacing transparencies and overhead projectors, and Google search replacing dictionaries and encyclopedias. A small number of staff (n=3) use technology innovatively, and one in particular is using mobile technology and Web 2.0 tools for learning. The small cohort is agentic in their approach to e-learning, and may find the outcomes of this research of particular value. It is hoped all staff will benefit, and ultimately, the students at the school.

Current roles of responsibility for ICT within the school are the ICT Lead Teacher/Administrator, which is the researcher's role, and an ICT Assistant who is also a teacher aide. The ICT Lead Teacher role has 0.2 release-time and 1MMU attached to it, and the ICT Assistant is employed 15 hours per week. To date, the majority of this time is spent on maintenance type activities, that is, trouble-shooting server, hardware, software problems, and purchasing and deploying equipment.

3.6 Data collection methods

In this study, it is necessary to gain an in-depth understanding of participants' beliefs or views and experiences, and the relationships and processes that occur within the natural setting. The methods chosen are those that best fit the nature of the research

questions. In this case, semi-structured interviews and participant observations were considered appropriate for capturing rich data.

3.6.1 Interviews and the semi-structured Interview

There are three main types of interviews: structured, unstructured, and semi-structured. The research question and objectives, how much information is known or required, and type of data needed, will determine fitness-for-purpose of each approach (Mentor et al., 2011).

Structured interviews can be more quantitative in nature and are mostly used in survey type interviews. The questions are scripted and followed strictly. Routing of questions is set, and is independent of responses given. The results of structured interviews may be more generalisable. In contrast, the unstructured interview is qualitative and exploratory in nature. There are no predefined questions or script to follow, and rich descriptive information is sought from the interviewee in a free-flowing conversational style. Certainly, they are most useful when only a little is known about a research topic. Again, they are used to gather views and information on broad areas related to research, and where research approaches and methods may need further refining, for example, as a pre-cursor to a semi-structured interview. The semi-structured approach is also qualitative, and is used for its flexibility. It is a conversational style discussion between the researcher and participant, and is intended to illuminate and deepen understanding of the participants' world. A clear advantage of unstructured and semi-structured interviews is being able to adapt questions as you go to gain more insights (Mentor et al., 2011).

A semi-structured interview was appropriate for this study as the goal was to illuminate the underlying beliefs or views of students, as well as the meanings attributed to their experiences. While I had an idea of the direction I would like the interview to take, and had questions to guide the 'ebb and flow' of the interview, students were encouraged to have their say in an open-ended way. The questions provided a form of standardisation across interviews, but within that, there was

flexibility and room for unexpected deviations that provided new insights. The semi-structured interview was designed for probing initial responses further, by digging below surface meanings to gather fuller meaning. Some questions over-lapped, getting participants looking at phenomena from different angles. Conversational interactions between students and myself were central to this type of interview process (Mentor et al., 2011; Silverman, 2011).

When the interviews took place, I had to ensure the participants' views were clearly interpreted. I had to seek clarification when meaning was unclear, and I had to verify my interpretations of their meaning. Checking back, or verification, meant I would share the interpreted meaning back to the participant and ask them if it was what they meant or intended. Indeed, this required time for processing and thinking, and space for negotiating and co-constructing meaning of the student's world. Within this time and space, meaning making, interpreting and re-interpreting took place. Notably, it was not a one-way process, as participants also needed 'think time' to process the questions being asked of them, and to formulate their responses (Kvale, 1997). Co-constructing meaning is a contemporary view aligned with research informed by the interpretive paradigm, (Fontana & Frey, 2005).

So that I could gather as much rich thick detail, and ensure students' voice was clearly established, two semi-structured interviews were undertaken. The first interview focused on gathering as much detail as possible about their beliefs or views, and experiences (Appendix 1). The second interview was designed to gather further reflections, more descriptive detail, and also to discuss and confirm any queries from the participant observations (Appendix 2). When looking at the transcripts of both interviews it was considered this dual approach was a worthwhile exercise, and even though it was time consuming, the second interview provided even more detailed description.

It was my intention to design and conduct quality interviews with the students. To do this I needed to know what a quality interview might look like. Kvale (1996) provides criteria for a quality interview as: rich and relevant data; succinct questions and full

embodied answers; meanings are clarified following responses; interpretation takes place throughout the interview; interpreted meanings are verified with participants throughout the interview; the interview reads like a story, and it speaks for itself. This acted as a guide as I went about conducting my interviews.

3.6.2 Participant observations

Participant observations assist the researcher in unearthing social contexts and the dynamics that take place within them. In essence, being able to hear participants' views and see their activities first-hand allows the researcher to 'see through their eyes'. Understanding the language use of the participants is important to understanding the interaction and behaviour, and being able to interpret these in relation to other data collection methods (Bryman, 2008; Denscombe, 2007; Mentor et al., 2011). How far the researcher becomes involved with the participants and their experiences is determined by the research aims.

I believe I needed to get a first-hand view of participants using mobile technology and Web 2.0 tools in their natural setting in order to better understand the social phenomena. Participant interactions and activity were recorded by note taking in the form of a running record (Appendix 3), and included some verbatim quotes and summaries of discussions involving participants. No specific schedule or framework was used for observing as it was felt that this could become restrictive to capturing all that was going on within the setting - any nuance, or the unexpected, may have been overlooked. Observations were made on three separate occasions to get a better-rounded view of students' use, rather than a snapshot.

3.6.3 Selecting Participants

The participants were a group of Maori and European secondary students (n=7), both male and female. They were chosen from Health and Physical Education studies, where the teacher of this course is using iPads and Web 2.0 tools to support their learning. The number of participants is reflective of the fact that this is a small-scale

case study and is interested in the language and meanings that participants bring. The number of participants also reflects the practicality and manageability of collecting and analysing vast amounts of data that qualitative research can produce. They were purposively selected based on ethnicity, gender, and school year level. It was important to have an equal representation of both Maori and European participants, male and female, for two reasons. First, it is a (smaller) representation of the school ethnicity and gender composition. Second, it was important to have the voice of Maori students represented in acknowledgement of the Te Tiriti O Waitangi. The group consisted of two Maori males, two European males, two Maori females, and one European female. The year level was also important as by Year 12-13 it was more likely that students would have had access to, or own some type of mobile device. It would also be more likely that students would be familiar with more common Web 2.0 tools, for example, Facebook, YouTube or Twitter.

In order to work through limitations of access to students, times for interviews and observations were negotiated with their Health and PE teacher and timetabled classes, and were set down on paper. It was imperative that this time was used effectively and efficiently to collect data. To be sure, students received notice of the next research phase to ensure they were at school when I was present on site. Again, setting up of a suitable interview room and equipment was done beforehand so there was no down time. In addition, two recording devices were used in case of technology failure of either device.

As a staff member of the research school I discussed the research proposal with my principal, who welcomed it. I also discussed it with the Health and PE teacher who shared an interest in the use of mobile technology and Web 2.0 tools. It was from her class of students that participants were drawn.

3.6.4 Ethical considerations

There are ethical considerations when conducting research. Gaining access to the research site and permission from appropriate authorities is important to any research,

and while gaining access to the research site may not seem like an issue for a teacher who already works in a school, having procedures for gaining access and permission adds to the legitimacy and quality of the research (Mentor et al., 2011). I provided explanatory information about the research to the principal (Appendix 4) and teacher-in-charge (Appendix 5), and obtained signed formal agreements from them. I had also met with the teacher to discuss her learning programme.

While the researcher cannot be totally sure that children or young people understand the purpose of their research, they can put measures in place to ensure participants are fully informed. The way this can be accomplished is by ensuring clear explanations about the research are given, and time given for participants to ask questions or discuss further. In this study, students were part of an initial discussion explaining the research, which included time for asking questions. Students who showed interest in volunteering were given the opportunity to ask further questions. Explanatory information was provided for their parents. The researcher's contact details and the research supervisor's details were included on the information sheet in case of any concerns.

Another issue involves working with children or young people, and gaining informed consent. The central issue with gaining consent is to do no physical, psychological or social harm to participants, and to demonstrate care for them. Especially, participants are made aware of any potential risks, participation is voluntary and free from any coercion, and they are carefully considered throughout the research process (Berg & Lune, 2012). Indeed, participants in this study were assured at the very first discussion, and again in writing, that participation was voluntary, and at any stage of the research they had the right to freely withdraw without any questions. Furthermore, they were informed of having the right to see any presentations or publications resulting from the research. In addition, that they could obtain an electronic copy of the thesis when completed, from the University of Waikato's digital repository. Procedures and rights should be clearly understood by participants, and formal agreements made prior to starting the research (Mentor et al., 2011). Written informed consent to participate in the research was sought from participant students

(Appendix 6), and their parents (Appendix 7). Similarly, permission for using photographs or screen shots of work in educational presentations or publications, which may identify participants, was obtained from students (Appendix 8) and parents (Appendix 9).

Another important issue is that of confidentiality and anonymity. Confidentiality means all effort is made to remove any elements within the research that might identify participants, or the research site, which in turn may identify the students. Anonymity means participants are nameless and given identifying codes or pseudonyms (Berg & Lune, 2012). In regards to the issues of anonymity and confidentiality Mentor et al. (2011) advise that we carefully consider how far we can go when making such commitments. For instance, if sharing the results of research within a local context, some participants' identity may be recognized - even if pseudonyms are used. The same can be said for confidentiality, where participants may disclose sensitive information. While the researcher is to keep participant confidentiality, the professional code of conduct for a teacher should be followed, especially where there is risk of harm to the child or others. In this study, the participants are obviously known to the researcher, and trust has been established between the researcher and research participants. During the introductory outline of the research, participants were assured of confidentiality and anonymity. Pseudonyms for the participants were used in the writing of semi-structured interviews, observation field notes, findings and reporting.

Ethical Approval

Ethical approval to conduct the research project had to be gained before proceeding. I familiarised myself with the Ethical Conduct in Human Research and Related Activities Regulations (University of Waikato, 2012) before applying for approval to conduct the research. On the 26th April 2012 an application was made to the University of Waikato Faculty of Education Research Ethics Committee seeking ethical approval to carry out the research (Appendix 10). On the 21st May 2012 I received a memorandum from the Ethics Committee highlighting the need for

additional information, which was returned quickly. On the 31st May 2012 the research received ethical approval.

3.6.5 Data collection procedures

The semi-structured interviews and participant observations occurred over four consecutive months, during 2012. I interviewed the seven secondary school students on two occasions. One took place at the beginning of the study, the other at the end. Both interviews took place on the school site in a resource room (known as Narnia) or the Deputy Principal's office. These rooms were used because they were available and known to the students. Also, they had either a glass sliding door access or glass windows, which meant participants could be seen at all times by passers-by. Importantly, this provided a form of comfort and safety for both participants and myself.

When students arrived at the interview room I greeted them and thanked them for their time. I also assured them that there was no right or wrong answer, and that I was interested only in their views or beliefs, and experiences. I gave them the guiding question sheets (Appendices 1 & 2), and time to read through in case they had any concerns or questions before starting. None of the participants had any questions, and were happy to proceed with the interview. Each interview lasted no longer than 35 minutes. All students showed enjoyment of being able to participate, and at no stage did they show signs of stress or not wanting to be there. At the end of each interview students were thanked again for participating and informed that they would be given a transcribed copy of the interview for their verification. As a token of appreciation participants were given a popular muesli bar.

Interviews were recorded using a voice-memo app on the researchers iPhone, which was then synchronized with iTunes on a pass-worded Mac Book. The size of the iPhone meant it was unobtrusive in the small environments, and easily manoeuvred. I carefully and painstakingly transcribed the interviews, and I revisited each transcript 2-3 times to ensure accuracy. The students were given their own transcript to check

and confirm that what was written accurately reflected what they had said, and what they meant. In the transcripts, pseudonyms were used for the participants in order to protect their identity. After each interview, in the evening, I listened to the recordings of the interviews and made notes to consider for future interviews.

I made three subsequent observations of participants during their learning programme where the purpose of learning was guided and framed by an NZQA Level 3 Unit Standard for Physical Education (New Zealand Qualifications Authority, 2012). The purpose of the standard was to "demonstrate movement vocabulary in performing the selected expressive movement form; and perform and review an expressive movement sequence" (Appendix 11). This meant students had to research a variety of expressive movements, and their background contexts, perform an expressive movement sequence in front of an audience, and review. To support students' learning the teacher responsible chose to use iPads, Web 2.0, and wireless connectivity. The iPads were used as a way of providing 'mobility' for the students so they were not restricted to one place. The teacher recommended YouTube and Google as suitable Web 2.0 tools for researching. During each lesson the teacher would do an initial whole-class check up to clarify the learning task and goal, check students progress and to provide feed-forward. Students would then gather into their groups and begin working on their task. The teacher designed the learning task in a way that students could work collaboratively in groups and independent of the teacher. During the observations, field notes were taken of the learning activity and students' interactions and behaviours. The observations focused mainly on recording students' interactions with the technology, other students, the learning environment, and were written as a running record of activity. When something was unclear, especially while working around loud music, I checked with students to get clarification, or gather further information. Students clearly showed enjoyment of what they were doing. However, some difficulties did arise during the participant observations with taking photographs. While it was originally intended I take photographs and use them as visual recounts for the final semi-structured interview, taking photographs became clearly uncomfortable for participants. Prior to this, participants had consented to having photos taken, but following a brief discussion

with students it was agreed to stop taking photographs (see section 4.4).

3.6.6 Reliability and validity

Reliability and validity are used to determine and assess the quality of a research study. Traditionally, reliability and validity are used for assessing mainly quantitative research. While it still applies to qualitative research, it happens differently. Reliability looks at the ability of a study to be repeated, with the same results. Validity looks at the integrity or dependability of the research findings (Bryman, 2012, p.45). However, determining the quality of a qualitative case study requires different ways of establishing reliability and validity.

Validity in a qualitative case study is established by ensuring participants agree that results accurately represent their world (internal validity), and sufficient rich descriptive detail is provided so that the reader can make comparisons and decide how applicable the study is to their situation (external validity). A parallel for internal validity is credibility (Bryman, 2012, p. 390). This emphasizes multiple accounts of social reality. To do this, research must show good research practices, and findings should be shared with participants for confirming that the researcher has interpreted their social world accurately.

Confirming that interpretation by the researcher is correct is known as respondent validation, or member checking. I was sure to get confirmation from participants in three areas. First, when conducting semi-structured interviews, if meaning was not clear a check back strategy was used. I would state my interpretation of what was said, then check with the interviewee if the interpretation was what they intended or meant. Second, following transcribing of semi-structured interviews, participants were provided with scripts for confirmation of what was said, or for any changes to be made. Finally, findings were given to participants for comment.

Reliability in qualitative research is established through dependability or trustworthiness. It entails that the results make sense and participants agree with how

their world has been represented. This can be achieved through keeping an audit trail of decisions made during data gathering and analysis, stipulating any researcher bias, and triangulation of data (Burns, 2000, p. 475).

Triangulation of data is when more than one method of data is used to get a fuller picture of the social phenomena in question, and for validating data. It is a way of one method making sense of the other, and a means of crosschecking so that confidence can be placed in the findings. I used semi-structured interviews and participant observations to gather students' views or beliefs, and meanings attributed to their experiences. I believe they were the best methods for gathering the types of data necessary for a deep and rich description of the phenomenon. The interviews allowed the students' voice to be heard, and participant observations meant that the relationships and processes in their natural setting could be observed (Bryman, 2008; Denscombe, 2007).

An audit trail provides a detailed account of the procedures and processes used in the research, which gives authenticity to the study (Burns, 2000). In this study, key stages and outcomes of the research process were documented. These included how research participants were selected, what data collection methods were chosen, and how the data were analysed. It also included how the research questions were formed, how semi-structured interviews were conducted and the resulting transcripts. How participant observations were conducted and the resulting field notes were documented.

3.7 Data Analysis

Choosing the appropriate data analysis method depends on the purpose of research and the nature of data collected. In this case study we are deepening our understanding of the participants' world. To do this, a qualitative data analysis was carried out using a thematic approach to guide the analysis process.

Thematic analysis identifies and describes themes within the data (Strauss & Corbin,

2012). Moreover, thematic analysis is not restricted to building theory from the data, and derived themes may be used in a summative way for explanation (Guest, MacQueen & Namey, 2012, p.12). Themes are derived from a repetitive process of systematically gathering and analysing data, keywords, key phrases or terms. These keywords, key phrases or terms are taken specifically from the participants' language, or can be modified slightly, and relate to the research questions. This is known as coding (Silverman, 2011).

Coding is basic to all qualitative analysis methods. It assists in interpreting, categorizing, conceptualizing, and theorizing data. Moreover, coding can be reflective, through writing memos that theorize from the participants' language. With coding, it is best to begin by sticking close to the data itself, then moving outward forming broader categories, then core categories. Importantly, sticking close to the data and then moving outward is done so as not to miss detail, intricacies, or surprises within the data, (Bryman, 2008; Denscombe, 2007; Silverman, 2011). Indeed, data analysis is not a linear process. It is an iterative process whereby there is movement back and forth between raw data and codes, categories and conclusions or theories. This is especially so between stages of coding, interpreting and verifying the data (Denscombe, 2007, p. 288). Emerson, Fretz and Shaw (2011) suggest we should always be asking *how* or *what* questions of the data. These types of questions look at the processes of what is occurring and in what order, the practical concerns or challenges in their every day lives, and the views and specific meanings of the research participants. In essence, the key to coding is in turning the answers to these questions into a single word or phrases that capture what is going on in the data.

In analysing and coding my data I took this approach of critically 'questioning the data' because it helped me to identify specific interactions of the participants. By asking myself in what ways or how were participants interacting, and answering using a gerund, these provided me a keyword or phrase for coding. As an example, when a student stated that they had watched their dance moves on the iPad with their group, I would ask myself what were they doing and how were they doing it. The initial words that came to mind were 'self assessing' and 'peer-reviewing', which

would then be placed in the margin of that line.

Cresswell (2009) identifies common steps found in data analysis. These are described in relation to this study. First, organise and prepare data by transcribing interviews, typing out field notes and observations, and arranging types of data. Second, get to know the data by reading through all of it and reflecting on its overall depth, credibility and use. Third, begin coding data (as detailed above). Fourth, generate themes or categories from the coded data by grouping topics, identifying patterns or causes, and reviewing these in relation to the raw data and research questions. Fifth, make connections with other themes or categories, and make broader categories. Sixth, interpret the meaning of the data by presenting the findings as the main ideas, or lessons learned, and using these to confirm, add to, or challenge existing ideas. With these steps as a guide, I was able to organise, process and present my data in a systematic way. After painstakingly analysing interview data line-by-line and coding with keywords and phrases (see Appendix 12) I then sorted these keywords or phrases into emerging patterns and categories that related to the research questions. I then took these categories and grouped them into broader categories. I also did this rather painstakingly using excel spreadsheets, colour coding and categorising entries (see Appendix 13). In this way, great care was taken to ensure that the findings would accurately reflect the main ideas contained within the data.

Chapter Four: Findings

This chapter presents the findings generated from this study. It presents themes that relate to the research questions, and have emerged through data collection and analysis of interviews and observations with seven Year 12-13 students. From thorough analysis of the interview transcripts and observation field notes, the themes that emerged represent students' own voices. The emerged themes are an indication of comments made orally by students during interviews and observations, and also from interactions and gestures that were observed. Their voice provides a rich and interesting presentation of their beliefs, expressed views and experiences of using mobile technology and Web 2.0 to support their learning tasks required for Level 3 Physical Education. Pseudonyms have been used to identify students in accordance with ethical requirements for this study. The following presentation of the findings relate to the research questions, which once again were:

1. Do students find it motivating and engaging using mobile devices or Web 2.0 tools in learning situations, and if so, why?

2. How do students perceive using mobile devices and Web 2.0 tools as influencing their learning?

The themes are presented in sections, and a significant number of relevant quotes are used to provide perspectives of students' voice to illustrate these. The first section addresses student motivation and engagement by describing the aspects of using mobile technology and Web 2.0 tools that were found by students to be motivating and engaging, and their ways of usefulness. The second section describes aspects of using mobile technology and Web 2.0 tools that students considered non-motivating, or disruptive to learning. The third section presents the expressed 'felt needs' of students as *learners*. The next section describes the held beliefs of these young people, the nuances they bring with them into learning supported by mobile technology and Web 2.0 tools, and the influence their beliefs and nuances have on their use of mobile technology and Web 2.0. The final section expresses the overall positive learning

experience of students.

In order to provide an overall context for the themes, detail is provided which describes the learning task. Students were required to research expressive movement forms (dances), gain background knowledge of these forms, and perform and review an expressive movement form sequence of their own (Level 3, Physical Education). In each session, they were required to work collaboratively in groups (n=5-6) researching dances and their backgrounds, choreographing their own dance sequences, and recording and reviewing their dance sequences. At the end of the term, they were required to perform their completed dance sequences for an audience. During each phase of the learning task, students had access to iPads, wireless connectivity to the Internet, and mobility to work in different physical locations as allowed by the teacher (inside or outside of the school hall). The teacher provided guidance as to some appropriate Web 2.0 tools they could use to support their research, for example, YouTube and search engines like Google Search, but did not provide specific links to dance forms. When students were choreographing their own dance sequences, they used the iPad as a recording device, and then as a reviewing device when reviewing their dance sequences. The researching, recording and reviewing of dance sequences were a cyclical process over eight weeks. While the teacher began each lesson as a whole class discussing the progress made and the next steps for groups, most of the time students worked independent of the teacher. At different times the teacher provided support to groups when they became *stuck* and was always accessible to students if they needed support.

4.1 Motivating and engaging aspects

When aspects of using mobile technology and Web 2.0 tools combined together with the learning context to work in useful and meaningful ways, the conditions were motivating for students, they felt positive, and engaged with their learning. The motivating and engaging aspects of using mobile technology and Web 2.0 tools in learning situations were viewed through the *interactions of students* within the learning context, with other people in the learning environment, and learning contexts

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beyond the classroom. When either of these aspects could not support their learning for whatever reason, then students became unmotivated, and disengaged from learning despite the presence of the technology.

4.1.1 Interactions of students

When students were actively engaging with people in their learning context and natural surroundings, and using mobile technology or Web 2.0 tools to support their activity, these were considered *interactions*. The types of interactions identified in this study were grouped as collaborative, constructive and evaluative.

Collaborating

Students involved themselves in collaborative type interactions while working together constructively with others to achieve their learning goal of performing and reviewing an expressive movement sequence for an audience. The groups were using one iPad for most of the time, and employed the use of a second iPad when they needed one. The main keywords or phrases used to describe students' collaborative interactions were sharing and developing ideas together, sharing knowledge, planning, discussing, creating content, listening, agreeing and disagreeing, practicing, problem-solving, and peer-tutoring. Students found collaborative type interactions both motivating, and challenging. For instance, members of one group found that working closely together and supporting other group members increased their learning, and especially when it came to using the technologies:

> That's good [sharing an iPad], cos (*sic*) you have other people that
> know more about it, and they can help me show like (*sic*), go
> exactly to where, what we're looking for, and we can all watch it at
> the same time (Erica, Interview 2. 76).

In another instance, students in one group were using an iPad each, which led to disagreements among group members and a lack of collaboration. As a group, it was

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decided that only one iPad should be used to make the process easier and lessen the number of arguments:

> …We just thought it would have been easier to use one [iPad]
> (Aaron, Interview 2. 45)…so we actually weren't having so many
> like (*sic*) arguments if we chose our one or their one (Aaron,
> Interview 2, 47).

At the beginning of a lesson the teacher would check if students knew their learning goal and had what they needed, then they were sent to work independently and make their own decisions as a group. No specific group roles were assigned to students. It was found that the more competent users of mobile technology, or those who had natural leadership ability, became highly motivated to take charge of the mobile device and make learning decisions for the group. When students were asked how working in a group with one iPad went, it was the view of some students that specific group members tended to dominate the learning. Strachan commented:

> Yes, only a couple [of] people really were the ones using the iPad
> as much, the other people sort of just let them use it (Strachan,
> Interview 2. 30).

> [Observation 2:21] Mervyn places iPad on stage floor while
> practicing his moves, he hovers over iPad as if to take control or
> ownership of it, or not wanting to give the device over to
> others…[Observation 2:22] Mervyn signals to others *it's time to*
> *record*…[Observation 2:36] Group 1 music is paused, and they are
> huddled once again looking at iPad screen, John is holding the iPad,
> Mervyn is reaching and touching screen.

When asked if the dominant users were members who were more confident with using the iPad, Strachan replied:

Yeah (*sic*)…they were the more confident users of the iPad, and they just wanted to find some more dance moves that they were keen to do (Strachan, Interview 2. 32).

Constructing

With constructive type interactions, students were hands-on using mobile devices or Web 2.0 tools. The keywords or phrases used to describe these interactions were locating, accessing, searching and finding resources, recording, creating content, editing, manoeuvring (iPads), capturing learning, mixing music. With constructing types of interactions students appeared to be engaged to varying degrees as long as all the conditions continued to support the learning and there were no technical or group issues.

It was good [using iPads] because well (*sic*) we used the iPads for practically our whole dance. Like we'd have one iPad set up to video us, and we'd have an iPad playing songs, the music that we dance to, and have another iPad, you know (*sic*), looking at dance moves, so [it] made it easy to look at ourselves, due to the camera application on the iPad, and [it] made it easy for us to you know (*sic*), just type in a dance on YouTube and then follow that (Mervyn, Interview 2. 18).

[Observation 2:58-62] Katie is watching screen on iPad which Strachan is holding, and is giving her group instructions "This is what you do guys," and models moves. Martin, Erica and Robert show some body movements, but appear reluctant. Strachan puts down iPad and follows Katie's moves. All group members are following Katie's moves and suggestions. Battery goes flat on iPad "We need another iPad," sighs Strachan, and leaves the hall to get one from the store cupboard in another building. [Observation 2:66] Approximately 7 minutes later Strachan reappears with

another iPad.

Evaluating

In evaluative type interactions, students were commenting on the work of others (dance and music sources) for their value or worth in assisting them to achieve their learning goal, and reflecting on the quality of their own work. The keywords used to code these interactions were reviewing, discussing, correcting, comparing, improving and progressing. Using iPads provided technical affordances that were well suited to evaluative type interactions, which involved students on a personal level as they reflected on what they were doing, and collaboratively as they sought ways of improving as a group. Students were deeply engaged during evaluative interactions as they had evidence of their own work on the iPad from which they could measure and compare with other dance sources:

> …we were correcting [dance moves], looking at them [videos of group dancing] and seeing what we did wrong and stuff (*sic*), like (*sic*) if we were out of beat, or if we weren't doing the moves right, [so] that's what we do when we're watching ourselves do the (*sic*) dance, and then we watched the pop-stars [and] whatever they were doing, then we just sort of progressed and kept looking back and correcting the mistakes, and getting our timing right and yeah (*sic*) that was it (Strachan, Interview 2. 68).

Katie shows in the following comments how motivated and engaged she was while using mobile technology to improve her learning:

> We were using it [iPad] by videoing ourselves, and well (*sic*) we used two iPads, one to play our music, and one to video us to see how well we were doing it or not, our routine or not, and it helped us [to] improve our routine (Katie, Interview 2. 24).

…when we watched the recording it was kind of a fail so we improved it [the routine] by doing the moves sharper, and the iPad was also like a mirror, not just recording, we can [also] put it on record but not play it, we can just watch ourselves go through the routine and make ourselves sharp (*sic*) (Katie, Interview 2. 30).

4.1.2 Ways of usefulness

Affordances

Affordances of mobile technology and Web 2.0 tools are about what students were able to do with them in order to achieve their learning goals, which they could not have done without using these specific technologies. Using iPads gave students greater mobility and freedom to make use of space both inside and outside of the school hall. The functions of the iPad meant a lot could be accomplished using a single device, and students had a tool that could support the entire learning process in fulfilling the requirements of the learning task. For these student participants, completing this task a year ago may have required the use of various apparatus, for example, a video, television, music player, and computer with Internet connection. Students were asked if they felt they could have achieved the same learning outcomes without the use of iPads or Web 2.0 tools and most students believed they needed both the iPads and Web 2.0 tools to achieve, and that their learning tasks would have been too difficult otherwise. Using iPads meant students were not spatially or physically restricted and could easily manoeuvre the devices according to their group needs and task. For example:

They [iPad and Web 2.0] were kind of like (*sic*) essential in this assessment for us cause (*sic*) we needed them to look up our dance moves that we wanted to learn…and then to play music on to practice, and also to record ourselves so we know what it [dance routine] looks like, and then we could play [it] back and watch, so yeah (*sic*), it would have been way harder if we'd had to try and do that without them (Wilson, Interview 2. 7).

…if you used a mirror you would have to have a huge one, and it would be harder to like (*sic*) carry around, and bring in before every lesson, and (*sic*) with the iPad you can just put it in front of you and stand back, and you can see the whole group in it (Erica, Interview 2. 18).

You can, but it would [in] no way be as creative and [you] wouldn't have as much (*sic*) good ideas as we got from the internet because we would just be going off you know (*sic*), our brains, what dance moves we've got in our brains, and as well as the camera, [you] can't really watch to see how we look, [because we] don't really have mirrors or anything either (Mervyn, Interview 2. 32).

Accessibility

Students were allowed to research for suitable expressive movement sequences anywhere on the Internet, however the teacher did guide them toward using YouTube or Google as a main source. Using Web 2.0 tools such as YouTube meant that students' learning went beyond the learning context of the classroom, giving them immediate access to resources. A common theme mentioned among the group was being able to access what information or resources they needed or wanted, and when they wanted them. In other words mobile technologies gave them 'just for me' and 'just in time' access to resources they needed. While initially it seemed like a manageable and interesting activity for students, they eventually found handling and managing the vast amount of resources available on the Internet frustrating and at times overwhelming to the point of disengaging from learning. Students voiced their preference for having the teacher provide just a few sites and links for them to view and choose from, rather than them having to search for suitable dances themselves. A point of frustration was trying to save or bookmark sites to return to in later lessons, as getting the same iPad was not always guaranteed, which was often the case, and

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students would have to repeat their searches over again.

Mobility

Students enjoyed the physical mobility that working with pads afforded, coupled with wireless connectivity, which gave them continual access to Web 2.0 tools. Students worked anywhere within the school hall, and outside on the deck or courtyard. Mobility and wireless access meant they could continue to learn without being physically or technically restricted:

> [Well] being able to do both the music and video taping [of] us at the same time outside…(Aaron, Interview 2. 20).

> We got to take them [iPads] outside, [they were] easy to move around, sometimes it was a bit hard to see the screen outside with the light and stuff, so that was a down (*sic*) thing (Strachan, Interview 2. 62).

4.2 Mediational aspects

Students expressed that at times they were lacking motivation and disengaged with the learning. This happened when the activity students involved themselves in were either lacking teacher support (eg., being more actively involved, more teacher direction), the task design needed scaffolding (eg., skills for managing vast amounts of internet resources), learning was disrupted by failing technology (eg., flat batteries), or due to group dynamics (eg., dominating members, using too many devices). When students were asked if they thought they were achieving or had achieved their learning outcomes, there was a mixed response. Some felt they had achieved, some were unsure, and two students did not feel they were achieving. The two students who did not feel they were achieving both signalled that 'lacking motivation' was a cause:

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No it's not the technology, it's the dance, it's yeah (*sic*) the group, yeah (*sic*) more the group cos (*sic*) we're not working together as well as we could be, and [we're] not really that motivated I think (Erica, Interview 2. 10).

…because [we] haven't really had much time and motivation, as well as creativity…like (*sic*) [it's a] bit hard creating dances (Mervyn, Interview 2. 4). Like (*sic*) [in] each lesson just being able to get [straight] in there and start dancing, [but] instead we just sit around wondering what to do (Mervyn, Interview 2. 6).

When asked what he would have done to motivate the students, Mervyn responded:

Get her [the teacher] to teach us a dance, or find us a dance we have to learn (Mervyn, Interview 2. 8).

4.2.1 Lacking teacher support

A clear theme that came through the findings was the importance of the teacher's role in supporting the learner and learning process. Students expressed the need for the teacher to be supportive by giving more direction, being actively involved in the learning process, and providing more guidance on suitable resources. They suggested that the teacher could have narrowed the search for appropriate content by giving them some suitable dance models from which they could choose. Students also shared that they spent too much time sifting through an overwhelming amount of resources found on the Internet, and felt time was wasted. When asked what they would have done differently if they were the teacher, responses indicated students wanted more teacher direction:

… [If I were the teacher] I would have researched like (*sic*) some alright (*sic*) dances the night before, and then put up the links, and some good music tracks for the class…(Wilson, Interview 2. 41)

...well maybe [she could have] given us some direction on stuff

that we should be able to do, or need to be able to do, or stuff like

that (Aaron, Interview 2. 26)

[By] showing us the website to go on, and making it easier by yeah

(*sic*) just telling us where to go and what website to use, how to do

it and yeah (*sic*) (Katie, Interview 2. 78).

...Sometimes we would be just randomly searching for dance

moves (Erica, Interview 2. 42). Most of the time it was a waste [of

time], because you don't find exactly what you're looking

for...(Erica, Interview 2. 44).

Strachan suggested that the teacher be actively present or involved with the learning:

I would have probably just come out there [outside], been there,

watch them [students] do it, give them some feedback or something

probably (*sic*) (Strachan, Interview 2. 36).

When asked if he thought his group needed more feedback and direction he replied:

Yeah (*sic*) maybe, or just a bit more pressure to do it, someone

watching and the teacher like (*sic*) videoing, yeah (*sic*) maybe

someone stand there and video would be much better than lying it

down (Strachan, Interview 2. 38).

When Aaron was asked what he might do to make learning more 'interesting', he too
referred to the importance of teacher direction:

Well first of all, I'd just see what my students actually knew about

the (*sic*) Web 2.0 tools or iPads, and what they didn't learn (*sic*)

just teach them, or make them teach themselves, but with a bit of

direction on what to do (Aaron, Interview 2. 57).

In one instance, Erica attributed her feelings of not achieving to herself and her group, rather than the teacher, but suggested how the teacher could help them achieve better in future lessons:

[The teacher could] yeah (*sic*) probably see when we're not fully

focused, and put us on track more when we're not looking at the

right things on YouTube and stuff (Erica, Interview 2. 56).

During observations, after the initial teacher talk with students, the teacher roved between groups at least twice to see where students were. When not working directly with groups, she was present at her desk, so students were able to approach the teacher to ask for help. When roving, one group was found to be struggling, so the teacher suggested a popular dance 'Thriller' students might like to try, and also took time to run through dance steps with them. This was an example of the typical routine of the teacher seen during observations.

4.2.2 School barriers

The state of the research school's technology often frustrated students, and at times disrupted their motivation to engage with the learning. Various reasons were given and could be sorted into two categories that were barriers to learning the school can do something about, and barriers that the school is limited to do something about.

Disarray

None of the students were satisfied with the school's technology in its current state, including its wireless connectivity, and all offered suggestions for improvements. On more than one occasion, students expressed their annoyance at the limited number of school devices, and their disarray. Several devices were found either not working,

with chords or batteries missing, or with flat batteries:

> I would like to have laptops that actually work, and [that] the
> batteries aren't lost, and the kids treat them with respect, and yeah
> (*sic*) that's it (Katie, Interview 2. 62).

> …cos (*sic*) sometimes there's not enough laptops, and the chargers
> don't fit to the laptops, and yeah (*sic*) just those sort of difficulties
> (Brishette, Interview 1. 80)

Personal device

Mervyn suggested an alternative to using school mobile devices was for students to bring their own. Of his own initiative, Mervyn had been bringing his iPod to school and using it to support his learning. He was not the only student doing this. The school did not endorse nor encourage this practice, though teachers tended not to mind more senior students using these. While Year 12-13 students were permitted to bring mobile phones to school, their school procedures required them to be turned off during class time or risk confiscation. When asked if he thought a 'Bring Your Own Device' strategy would be helpful, he answered:

> Yeah (*sic*), speaking from experience, when I'm in English,
> whether I'm having a problem with you know (*sic*), needing to
> know some information, not cheating or anything, but I'll just look
> it up on Google and it has the answers there for me, and even you
> know, [you're] just listening to music in class in your headphones
> [it] keeps me focused (Mervyn, Interview 2. 88).

Wilson also bought his own device to school. He spoke of some advantages and disadvantages of using his mobile phone to support his learning:

> It depends, it can be good to use the school ones [devices] because

they have all the stuff [software, applications] that we need loaded

on there, but its less personal, and then you have to figure out how

to use the school devices anyway, so it's…yeah (*sic*)…sort of yes

and sort of no, I like my own device cos (*sic*) I know how to use it,

and I know where everything is and how to operate it, but then

there's (*sic*) other things on my phone like music and other stuff

that I have to go through, that like (*sic*) isn't contributing to

learning or anything, so the ones that are at school, are just all (*sic*)

solely for that, so yeah (*sic*)…depends (Wilson, Interview 1. 14).

Teachers limited use of technologies

Very few teachers employed technologies to support learning effectively on a regular

basis. The lack of a sufficient number of devices, and frustrations with infrastructure

(Internet connectivity, including wireless) may have contributed to this. Therefore,

with the diminished use by teachers, students' use of mobile technologies across the

school curriculum was limited. The ways in which the majority of teachers had used

technology regularly was as a *replacement* for older technologies. In this manner, the

technology was controlled by the teacher and used in a replacement fashion. For

example, PowerPoints and a projector replacing an overhead transparency projector.

Mervyn stated that as a school something needed to be done to encourage teachers'

use of mobile technology and Web 2.0 tools:

A computer room, like a room where it's just (*sic*) set up with

heaps of laptops, and iPads, it is just (*sic*) solid internet all the

time…oh I don't know actually…probably more iPads in every

class, cos (*sic*) you know that's another reason why teachers won't

use all these apps and stuff because they haven't got access to iPads

for every student to look at and stuff (*sic*) (Mervyn, Interview 2.

86).

Blocked sites

School network security was also noted as disruptive when students wanted to access Web 2.0 resources for learning. When Brishette was asked if sites like YouTube or Facebook might be good for learning she answered with the following:

> YouTube, oh (*sic*) Facebook you could count out, I mean you could live without that cos (*sic*) we all go on it [Facebook] in the afternoon, but YouTube that's where we learn a lot of the (*sic*) stuff, like last year when I was doing two solos for my music [assessment] I needed to choose two songs, but we were blocked from YouTube, so we had to keep asking the teacher for his password [to unblock access], and it just got so annoying after a while (Brishette, Interview 1. 114).

Battery life

Students mentioned that batteries going flat during lessons, or having to recharge them upon receiving them, disrupted their learning. This was found to be annoying, and restricted their mobility, as they had to stay connected to power sources for parts of their lessons. As the devices were shared with other secondary students, they did not know what state the devices would be in when retrieving them for their own use.

4.2.3 Technology barriers

iPad Screens

The screens on iPads were also mentioned as having too much glare when used outdoors, or being too small when trying to view it as a group. However, one student found the screen size, and battery life, adequate:

> …iPads especially (*sic*) are good as (*sic*), cause it has (*sic*) a decent battery life on them, good camera, and yeah (*sic*) big screen and stuff, you know its easy to learn off it (*sic*), like its pretty high

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quality and stuff [and the] camera too, like when you're watching

[your recordings] so it makes it much easier to see what you're

doing (Mervyn, Interview 2. 56).

4.3 Learners' felt needs

Students were able to quickly identify and express their own felt needs as learners.

Their felt needs centred mainly on needing more support and direction from the

teacher [section 4.2.1], and acquiring new skills for using mobile devices and Web

2.0 tools in learning situations.

4.3.1 Learning new skills

When discussing skills used for formal or informal activities involving mobile

technology or Web 2.0 tools, most students were able to identify particular skills they

felt were necessary to have, and ranged from basic skills to more complex skills:

> You have to learn how to turn on a computer, and know how to get
>
> to it [Skype]. It's just the same as Facebook, now it has a camera
>
> you can talk to, talk through, and it's like Skype, you can talk
>
> through it…Skype has a bigger picture, and Facebook has like it's
>
> kind of little, but you get to engage with your friends. Yeah (*sic*)
>
> it's really good…you have to learn like (*sic*) how to switch the
>
> camera on, and actually learn how to make your own Skype email
>
> and stuff (Katie, Interview 1. 62,64).

> In some [activities] there are [skills], like for instance making
>
> videos on the laptop because you're using a video creator, which
>
> takes a bit of know-how, as well as an audio editor, so that takes a
>
> bit of skill (Mervyn, Interview 1. 44).

When one student was asked how he felt about using Web 2.0 tools, he stated:

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Not good, because I don't really have a general understanding of
how to use them (Aaron, Interview 1. 75).

When asked where or how they might learn necessary skills, the main sources
referred to were from school or the teacher, peers, and self-help or 'play' as practice:

In school, from teachers, [we] just need to know how (Aaron,
Interview 1. 78).

…yeah (*sic*) I think you do need to learn them [skills] in school,
because the way the world is going today it's all technology
(Mervyn, Interview 1. 64).

…I'd like to get better at some of the computer skills cos (*sic*) [a
friend] David he knows what he's doing and I, you know
sometimes I have to go to him and be like (*sic*), "What does this
mean? What do I have to do? It asked me to do this?" So I'd like to
bump up my computer knowledge (Brishette, Interview 1. 42).

By other students teaching you if you don't know how to do it
cause (*sic*) they, most of them, know how to do it, or [from] the
teacher (Erica, Interview 1. 59).

Well then if they [friends] don't know how to learn [Skype], if they
don't know about it then you have like (*sic*) an IT person come in,
or just a teacher that knows a lot about technology, about
computers and stuff, and teach them how to go on, and how to set
up their own account and all those things. You're probably going to
need it [technology skills] in the future when you grow up, cos (*sic*)
the world is really big, and you'll need to know what technology is
and how to use it (Katie, Interview 1. 72).

While students indicated an expectation to learn mobile technology and Web 2.0 tool skills from school or the teacher, there was also a leaning toward acquiring these skills by themselves.

Self-learning and 'play as practice'

When asking students how they acquired skills or knowledge that enabled them to use mobile technology and Web 2.0 tools in both formal and informal situations, students often referred to self-learning, self-help, and 'play' as practice:

> Well with a bit of basic know-how of using a computer, just mucking around, [and] playing around with the video editor and audio manager. Just playing around with it, and then for real technical things just looking up on YouTube, or asking a parent or something (Mervyn, Interview 1. 50).

> By using the web or iPad more often (Aaron, Interview 1. 40)

> Playing around with it [iPad] (Erica, Interview 1. 61).

When Aaron was asked if he struggled to use the iPad, his response indicated that even in a group situation they opted to teach themselves what they needed to know:

> Yes, but my fellow group members helped me, and we just learned how to use them as a group and taught ourselves (Aaron, Interview 2. 63)

One student did not see it as learning new skills, but rather gaining an understanding of how things work:

> Not for me, no skills involved…the more you use [the] Internet I

think the more you tend to understand how it works…cos (*sic*)
there's just so much stuff (Strachan, Interview 1. 84).

A good example of self-learning is Wilson, who taught himself how to mix music:

Mobile technology…yep (*sic*) we used the laptop to mix-up our
music for the [school] production, that was helpful cos (*sic*)
otherwise that would have been a fail, but we had to edit all the
songs together, that was good (Wilson, Interview 1. 22).

When Wilson was asked how he learned to mix music, and if there was a particular
programme on a mobile device or over the Internet he used, he shared:

Yeah (*sic*) you have to be like computer literate or whatever, you
have to be able to use them, like (*sic*) know how to do stuff on a
computer (Wilson, Interview 1. 24).

…Virtual DJ, it's this free software online that you can download
onto any computer, and then you just download it and then that's
how you mix those songs together (Wilson, Interview 1. 26).

They [Virtual DJ] have a tutorial online that you can read, that's on
the page where you download the software, but mostly [it] was trial
and error…just having a play on it (Wilson, 1. 30).

To further illustrate the idea of being a self-learner, Katie was asked how she thinks a
person becomes knowledgeable about mobile technology and Web 2.0 tools, to which
she replied:

Knowing how to get on themselves, like doing it for themselves
and just focusing on technology more than anything else (Katie,
Interview 1. 78)

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4.4 Students' held beliefs and nuances

Students' beliefs provided nuances about their use of mobile technology or Web 2.0 tools. Their held beliefs contributed to the ways in which they used mobile technology in formal and informal situations:

Status symbol

Katie, a teenage Maori girl, shared what using an iPad felt like to her, and how she related the experience to being culturally privileged or economically advantaged:

> I'm not being sad to Maoris, but like some people they (*sic*) don't really have anything, like (*sic*) they probably have like (*sic*) a cell phone, but like (*sic*) not one that is really updated to how the world is right now, and for using iPads at school far (*sic*) that's like really blessed, really blessed for having those, they're really, really expensive but they're also really good for learning, and I feel like a millionaire cos (*sic*) I'm holding one as well (Katie, Interview 1. 123).

Some students viewed the use of mobile technology as holding status, or possessing a social artefact that is fashionable:

> Oh well cos (*sic*) you see *everyone* nowadays just using technology, like everywhere you go there's someone on their phone or something like that, and you know you kind of get surrounded in it as well, sometimes it can be a bad thing, sometimes it's not (Brishette, Interview 1. 66)…It's so fashionable (Brishette, Interview 1. 72).

Age-related

Some students felt that competency in the using mobile technology and Web 2.0 tools was age related, and that the younger you were the more technology savvy you would be. They also viewed older people, including teachers and parents, as not being up with the practical know-how of technologies and the ways that young people use them, especially in informal situations:

> …some people can't, might not understand the way you text, so maybe you have to do types of texting, maybe they want you to write it in full, full English, not text cos (*sic*) some people don't understand like (*sic*), for instance, for example, my mum…but for your friends and stuff like (*sic*) I can text my friends how I like texting and they understand it, but I don't know maybe it's just a generational thing (Katie, Interview 1. 5).

Distracting

Most of the students held the view that the use of cell phones and Web 2.0 tools such as YouTube and Facebook were not always conducive to learning situations; they were considered to be distracting in some way, or at some time:

> …We're allowed to have cell phones at school, but most people get distracted and hide them underneath the table during class, and it's affecting their, our learning, and yeah (*sic*) it's just common (Katie, Interview 1. 92).

> …iPad's are really good for learning…the teacher can see what you're doing, and it does help you a lot on (*sic*) learning, [but] sometimes it is not effective if your distracted on YouTube or something, but other than that yeah (*sic*) they're really good for learning (Katie, Interview 1. 100).

When Katie was asked why she did not believe cell phones could assist her learning, she added:

> …Well it [cell phone] won't help because if you've got a boyfriend or a girlfriend or something, you're most likely to talk to them and text them rather than use your phone for the reasons you've been given, otherwise just not even focusing on the teacher, or focusing on what they asked you to do, and just doing your own thing on your own cell phone, and (*sic*) they gave you permission to do your work and not what you were doing (Katie, Interview 1. 114).

On the other hand, Aaron thought the use of cell phones would be very helpful:

> Well I would probably, maybe record or video specific things that the teacher is saying, so it can help me in the future, or just so they can tell me what I should look up in the class instead of showing us in a massive group (Aaron, Interview 2. 71).

4.5 Positive learning experience

Most students were very positive about their learning being supported and enhanced through the use of mobile technology and Web 2.0 tools. While some expressed mixed emotions about different aspects of their learning experience with mobile technology and Web 2.0 tools, as previously stated, on the whole all students felt that using these technologies made a positive difference to their learning:

> Well it assisted my learning because it was mobile, so we could access YouTube and the camera where we wanted to actually practice, instead of one place, so either outside or in another place around the school (Aaron, Interview 2. 6).

> Well [using the iPad] it's pretty much going to help us pass because

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we need it to go on YouTube and listen to the music, and listen to

the songs we got, and it helped us get new moves and learn off it

(Katie, Interview 2. 10).

It felt good [using the iPad], like it makes it more easier on us, cos

(*sic*) some of us are really un-co (*sic*), un-coordinated at dancing

and stuff, so the iPad helped us, it was easier for me personally

because I got moves off there that I haven't seen before, and it

helped me learn the moves that I never knew (Katie, Interview 2.

16).

Wilson expressed how positive the experience was for him:

Yep (*sic*)! It was real fun. I enjoyed using the iPad to look up dance

moves, learn some new styles, listen to some new music like (*sic*)

to use when we were dancing, it was mean (*sic*) (Wilson, 2. 19).

When Katie was asked what she would do to make learning interesting she expressed
that having 'fun' should be part of all learning. The element of fun in learning was
thought of as motivating and engaging for students:

Well, I would get the kids to go on YouTube and explore what I

ask them to do, and probably tell them to make a PowerPoint or

video themselves doing something, to make it fun, more practical

work than theory work, and it will [hopefully] make them more

interested in the subject that they're taking with me (Katie,

Interview 2. 66).

When Katie was asked how she thought making something fun helps you to learn,
she added:

I don't know, [but] from my experience it just helps you listen and

respect the teacher more, and helps you learn things you haven't

known before [and] by having fun as well (Katie, Interview 2. 68).

She was then asked thoughts on whether she felt having fun made the learning stick:

Yeah (*sic*) it helps, when you're having fun…but its better if you

know it (*sic*) and understand things, then it makes your class

easier…and you will (*sic*) just want to keep doing it, and if you

don't understand things you will (*sic*) just get bored and not want to

listen to the teacher cos (*sic*) you don't understand (Katie,

Interview 2. 70).

Even when students were not using the iPads most had fun, remained focused and
enjoyed their learning:

[Observation 2:53-55] Boys in this group are clearly enjoying

themselves and are totally focused. They are lined up across the

glass doors and each one is trying different moves and watching

themselves in the door reflection. Wilson appears to be taking

leadership and getting the boys to follow his suggestions. The iPad

is sitting on the amplifier not being used at this stage.

4.6 Summary

This chapter presented the findings generated from data collected and analysed in the
study. It presented themes that emerged from the data, and described verbatim
students' views and voice to exemplify these key findings. In summary, the themes
were: *motivating and engaging aspects of using mobile technology and Web 2.0
tools*; *mediational aspects* of using mobile technology and Web 2.0 tools; *learners'
felt needs*; the *held beliefs and nuances of young people*, and the overall *positive
learning experience* that was had by the students. The next section explores and
discusses the findings.

Chapter Five: Discussion

This study, through the voice and experiences of students, explores the use of mobile technology and Web 2.0 tools for supporting learning and whether students found them motivating and engaging. The findings are discussed in relation to the research questions.

1. Do students find it motivating and engaging using mobile devices or Web 2.0 tools in learning situations, and if so, why?

2. How do students perceive using mobile devices and Web 2.0 tools as influencing their learning?

Following discussion that responds to the research questions, implications are drawn out and recommendations are made for using mobile technology and Web 2.0 to support learning in more effective ways. Overall, this study indicated that students found using mobile technology and Web 2.0 tools to support their learning a positive experience, but there were significant factors of that perpetuated or diminished students' motivation and engagement. The main factors were:
- the role of the teacher and relatedness
- learner competence and informal learning
- student autonomy and technical affordances
- students' perceptions
- the importance of students' voice

As student motivation is the precursor to student engagement, and I have treated them as *one leading to the other*, I draw on Ryan and Deci's (2000) Self Determination Theory, which discusses students' need for autonomy, competence and relatedness to be met in order for students to be motivated to learn, and relate it to this study's findings on students' use of mobile technology and Web 2.0 tools.

5.1 Teacher's role and relatedness

This study found that the role of the teacher is imperative if mobile technology and Web 2.0 tools are to be used to support learning in ways that are effective, and where students will find the experience motivating and engaging. The findings showed participants wanted more teacher involvement and guidance throughout the learning process. Students expressed that an active teacher presence would have kept their learning momentum going, and their focus and motivation would have been higher. When students were left to work collaboratively and using devices without support from the teacher for periods of time, students' motivation waned. There is an expectation students have of teachers to be actively involved with their learning, even if students are working collaboratively and using devices associated with independence and learner autonomy. The intent of the teacher in this study was to share control of the learning with students (greater student autonomy), by adopting a facilitative role and having them work collaboratively and independently in groups. Some students enjoyed working independent of the teacher and having more control over their learning at times, while others needed and wanted more teacher direction and structure around them.

The findings strongly suggest that too much independence with little interaction or support from the teacher leads to disengagement from the learning task. The findings highlighted that the mere act of *using* technology was not sufficient to keep students motivated and engaged, neither was the social context of working collaboratively within a group, but students wanted to relate face-to-face with the teacher. Though the reasons for this were not altogether clear, it could have been that some students did not have the knowledge or skills for learning collaboratively or working with these technologies, which meant they were feeling out of their depth and needing assurance. The role of the teacher is a vital link in meeting the learners' need for *relatedness* as described by Ryan and Deci (2000). The implication from this is that, the teacher needs to ensure they keep interacting with and relating to students, even while they are working in collaborative situations supported by mobile technology and Web 2.0. Teachers must not abdicate their vital role to forms of technologies associated with independence and autonomy.

Students need relatedness, they need to know they are being valued and are cared about by their teacher throughout the learning process. Therefore, it is recommended that the teacher meet students' need for relatedness by being actively involved and conversing with students about their learning, inquiring about their progress, providing relative feed-back and feed-forward, and giving timely support in learning situations that use current and emerging technologies. In some ways this seems at odds with Bruffee's (1995) definition of collaborative learning, where the teacher turns problems or issues back to the group to resolve, but unless students have had sufficient previous experience learning collaboratively, then expecting them to do so while using current and emerging technologies, will cause students to struggle and reduce the quality of their learning experience. This is important for the teacher to understand, especially when so much is at stake for secondary students, Vaughn et al. (2011, p. 124) point out that the facilitator needs to "direct and sustain the collaborative process by helping to manage potential conflicts and ensuring that the work produced by the groups is aligned with the intended course learning outcomes."

Task design

A critical factor ensuring mobile technology and Web 2.0 tools are used effectively to support learning is *task design*. Vaughan et al. (2012) emphasized that task design is crucial to collaborative learning supported by Web 2.0 tools. They argue that the task design must be intentional and that we should be designing into the task the types of learning behaviours we want for our students (eg., critical reflection, open communication and trust, and group discourse) and then decide in what ways technology can support these.

In this study, the task was collaborative in its approach, and required students to work collaboratively rather than cooperatively. For example, when conflicts within groups arose over use of iPads or choosing suitable dances, students negotiated their way through conflict as a group. Also in this study, tasks were not delegated to individuals, but all members worked together on a common inquiry and assigned necessary roles from within the group. However, students strongly indicated they wanted more

direction and input from the teacher. What was effective in this learning task was the fact that technology use was an integral part of assessment, and this factor kept students striving forward to attain their learning goal. The learning goal and assessment in this study was for the most part directed by criteria from a NZQA Level 3 Unit Standard for Physical Education (Appendix 11).

Scaffolding the learning

Equally important to task design is *scaffolding* throughout the learning process. This study also strongly suggests the need for the teacher to sturdily scaffold students' learning that is supported by current and emerging technologies. In the study, students expressed their expectation of the teacher to provide more structure and resourcing for the lesson. Students had spent lengthy periods of time trawling websites for appropriate resources, which was an ineffective use of time as commented on by them. Teachers cannot assume that students can find their way on the Internet, as this study has shown, when students cannot find suitable resources after a relatively short period of searching they disengage from the learning. Ryan and Deci (2000) tells us that students need to feel they can succeed, so conditions for learning need to support their steps toward success. This means the teacher has to do a lot of preparation beforehand to ensure students are well supported and the conditions are right for learning. The implication of this is that teachers need to have an active input in both managing the access to online resources for students, and supporting students' processing and productive use of online resources. Therefore, teachers may need to go to the extent of providing students with a smaller number of recommended websites, and use an online bookmark site such as 'Only2Clicks' [www.only2clicks.com] where students could then access these websites (with a classroom account) from any device. Teachers would also do well to *model* the processing and productive use of resources with the class.

This study has also shown that working in online environments with Web 2.0 tools can be challenging, and students need to have tangible support in order to persevere. This means that if we want students to increase their tenacity and perseverance for

working in online environments, then skills, resources and on-going support should be made available to students. This also means the teacher demonstrating how to navigate and use online environments appropriately and effectively, and building a community where learners help and support one another both in the class, and online. Added to this, the teacher needs to anticipate potential problems and prepare helpful resources that students can refer to for help - for example, bookmarking help forums for common issues, or by teaching students how to use Google search to find appropriate forums for solving common problems.

Teacher modelling

This study suggests that the teacher needs to model and demonstrate practices they would like the students to be using, which includes the appropriate and effective use of technologies. Teacher modelling and demonstrations can gradually diminish as students grow in confidence and competence. This implies that whatever practices, behaviours, and use of technology the teacher wants students to demonstrate, the teacher must design the modelling and teaching of these into the task. By doing this, students will knowing what it is they need to be doing, and how to do it. The teacher needs to ensure the learning is clearly stepped-out. Therefore it is recommended that the teacher model and demonstrates effective ways of using technologies to support learning. This is especially important when emerging technologies are being introduced into learning programmes.

5.2 Learner competence

The findings showed that when students were competent users of mobile technology and Web 2.0 tools they could teach less competent students, take lead roles within their groups, and were motivated to do so. Being competent was identified as one of the needs of learners in order for a student to have self-determination, along with relatedness and autonomy (Ryan & Deci, 2000). Important factors underpinned a student's level of competence when using the mobile devices and Web 2.0 tools in learning situations: their prior knowledge and skills, previous experiences with

technologies, a clear understanding of the learning task, and support available to them in the form of self-help, peers and the teacher as expert. Where learners had prior knowledge and skills, previous experiences, or were able to self-help, they were more competent users. Where students clearly lacked knowledge and skills, previous experience or self-help they tended to rely on other students' expertise rather than go to the teacher, or they had a tendency to disengage from segments of the learning. When students repeatedly disengaged, it became evident that they had lost motivation to continue learning. Interestingly one student stated that the teacher should have given them stuff they were *able to do.* Teachers cannot presume that all students arrive at school as competent or native users of mobile technology and Web 2.0 or that they will take the initiative to teach themselves how to use technologies, or even have the perseverance for working in sometimes challenging environments. As this study has shown, students come to school with varying skills and abilities that they have acquired mainly from their informal use of technologies. The implication of this is that the teacher needs to know what their students are able to do, or not able to do, in order to meet their learning needs. The teacher cannot assume students have sufficient skills, or that they do not have any. This study recommends that the teacher gives careful thought to the knowledge and skills required in order to complete a learning task, and that they know the prior knowledge and experiences of their students. The teacher needs to ensure that students' knowledge and skill base for using technologies can meet the requirements of the task. Where gaps exist, then the teacher needs to bridge these through scaffolding.

Teacher expertise

This study also shown that there are possible tensions between what students believe about teachers as being experts of technology. In the study, it was observed that when they had problems related to technology they tended to rely on peers or on self-help, rather than ask the teacher help. However, during the interviews students commented they wanted more support from the teacher. While clearly there were no student-teacher relationship problems, the reasons why they did not approach the teacher were inconclusive, and could be an area for investigating in future research. This

study can only speculate that students viewed their more competent peers as having more expertise than the teacher, or that they did not want to appear dumb in front of the teacher or peers. It was also evident that students *liked* to 'have a go' at learning skills for themselves through practice and play, rather than ask the teacher for help. However, if they did not succeed with self-help they then had a tendency to give up and disengage from their learning, which then had a downward spiralling effect on their perception of the technologies, task and teacher.

For teachers, this means keeping a close eye on what students are doing, and provide support where students may be struggling in order for students to have success. The irony of this is students may indeed perceive teachers are not experts, and therefore not able to offer expert help. The implication of this is that the teacher needs to show competence and some expertise when using technologies to support learning for students. Students had an expectation that the teacher would have both learning content knowledge *and* technical knowledge to support their learning, and that the teacher would be an expert they could rely on - even though students' actions in this study showed otherwise. This further implies that the teacher needs to be actively involved, even when students are choosing to help themselves, so that students do not become overwhelmed and give up. Therefore it is recommended that the school ensure that staff have professional development that transforms pedagogy in ways that integrate the effective use of technologies to support teaching and learning programmes. The type of professional development needs to include knowledge and skills for working in online environments (eg., Web 2.0 tools, communities of practices, online help, etc.), so teachers can competently support the learning process within these environments.

Informal learning
This study raised the important factor of *informal learning* for these students, and that a lot of their learning about technology took place outside of the school. Even though much of their informal learning was narrow in terms of the devices used and the types of activities undertaken using them, they were clearly valued in some way by the

students. This means that teachers also need to value the knowledge and skills students get from informal learning situations, and look closely at these. While students' informal use and knowledge of technologies may not be for learning purposes, it can be harnessed for learning. Teachers need to know what their students can do already, or can't do as the case may be, and not treat all students as 'having a clean slate'. Encouraging the use of what students already know (their informal knowledge and skills) will also help to increase levels of competency in students for more formal learning situations supported by mobile technology and Web 2.0 tools.

5.3 Student autonomy and technology affordances

This study found that student autonomy was increased through the affordances that came from using iPads and Web 2.0 tools. Burden and Atkinson (2007) rightly points out that we should not be asking what the tool could do, but rather we should be asking what students could do with the tool. Though there were obvious struggles for some students, all of them felt they could not have achieved their learning goal without the use of mobile technology and Web 2.0 tools, or at least it would have been much more difficult. Using iPads and Web 2.0 tools meant that students had greater choice and control over their own learning, which according to Ryan and Deci (2000) increases student's autonomy as a learner. The technological affordances of the iPad and Web 2.0 tools like YouTube gave students *just in time*, *just for me* and *from anywhere* access to resources, knowledge and skills in order to complete their learning tasks (Kukulska-Hulme et al., 2011). It was compellingly evident that the design and functionality of the iPad meant that all of the task requirements could be completed using a single mobile device, where as relying on previous technologies may have meant using several devices for researching, recording, and reviewing. This has implications for schools considering upgrading older technologies to current and emerging technologies such as iPads or similar mobile devices. It means they can put a potentially powerful learning tool into the hands of students that can transform their learning experiences, making them more personalised, and providing opportunities for increasing student autonomy as students take control of their own learning in greater ways. However, this study also confirms that teachers who are using, or

exploring the idea of using, technologies to support learning in the classroom need to understand that merely using mobile devices and Web 2.0 tools does not guarantee student motivation and engagement. Neither does using technologies guarantee holding students' attention, or that formal learning will take place, as there are other conditions previously mentioned that need to be met.

5.4 Influences on students' perceptions

During both interviews, questions were designed to better understand background influences on students' perceptions of mobile technology and Web 2.0 as being useful for learning, or not. They revealed some interesting ideas that stemmed from students' held beliefs, previous experiences, and prior knowledge and skills. These ideas influenced how they perceived the usefulness of mobile technology and Web 2.0, and how they related to peers with whom they were collaborating.

Informal and formal use
Some students believed that Web 2.0 tools like Facebook and mobile devices such as cell phones were more about socializing, and could not see a lot of benefit from using them in a school setting. Students felt mobile phones would be a distraction and were a device well known for communicating amongst friends. However, one student suggested mobile phones would be a handy device for capturing learning content to be referred back to later. Up until recently, mobile technology and Web 2.0 tools have not been a part of traditional school settings and its norms and practices. Students' beliefs are shaped by these norms and practices and how things work, that is, until new practices become the norm (Murray, 1990). This has implications for schools and teachers to adopt emerging technologies and appropriate practices until they become normal practices within school programmes, so students will begin to see the value of these tools for supporting their learning, and not just as tools for socializing outside of school time. A further implication is for teacher pedagogy to be transformed from traditional pedagogies, to a pedagogy that uses emerging technologies to support learning situations within and beyond school settings. For

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example, when discussing the idea of using Facebook to support learning, students viewed it as a space for private and public socializing and not for learning, and even though a Facebook page had been set up as a form of communicating between the teacher and secondary PE students, the participant students were vague or not overly enthusiastic about it.

Equity and opportunity

The important issue of equity and opportunity for using mobile devices (in this case iPads) was highlighted in this study. As educators we can too easily presume that students raised in this seemingly digital environment have access to and opportunities for using current and emerging technologies at home and school, but as this study has shown, this is not true. While most students had used mobile phones for social purposes, this was the extent of some students' digital experience outside of school. For some students, the opportunity at school to use an iPad with Internet connectivity for learning was an *honoured task*. The implication for schools is to provide students with exposure to these technologies as best as they are able to. For the teacher, it means integrating the use of these technologies as effectively as they can to support students' learning. What was also significant from the findings was the perception that *Maori* students would less likely have the opportunity or access to using these devices in the home than other students. This also has huge implications for the school and teachers to provide Maori students with learning opportunities supported by technologies, and to promote to the wider school community the *value* of opportunity and access to technologies beyond the classroom for *all* students.

Native users

There were presumptions among students that most young people possessed 'native-user qualities' and were naturally knowledgeable and skilled when it came to using technologies. This was especially the view of those who had only a few skills. Because students had this view they tended to rely heavily on peers for knowledge and skills when working collaboratively on their learning task, and not the teacher. When it came to using technologies some students also described themselves as

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belonging to a generation that was quite distinguishable from older generations (parents and teachers). It was suggested that a communication breakdown existed between the two generations, and that the older generation did not always understand younger people and the ways in which they communicated. This too may have in some way contributed to students relying on peers or self-help when needing support with their learning tasks.

Previous experience, prior knowledge and skills

The previous experiences of students in both formal and informal settings varied, and influenced how they perceived the usefulness of Web 2.0 tools and mobile technologies to support learning. All but one of the students owned or used a mobile phone. Some owned iPods too, but most of the students had experienced using iPads during PE classes towards the end of the previous year. All of the students were familiar with Web 2.0 sites Facebook and YouTube and had used both of these for personal and social purposes. Whether students had prior knowledge and skills using mobile technologies and Web 2.0 was also influential on how they *felt* about their experiences in this study.

5.5 The importance of students' voice

This study has demonstrated the importance of the inclusion of students' voice in research. It revealed rich description, which gave me a good look into participants' daily-lived reality. Students highlighted salient issues for teachers to consider when using technologies to support learning. If conversations had not taken place with students then teachers' practices may have continued unchanged, unaware how what they do, or not do, impacts on students' learning. Having students' perspectives challenges held assumptions. For example, the teacher in this study may have believed her students, being older, were equipped to work independently and collaboratively in their groups while using technologies to support their learning. This study has shown this was not the case, and that teachers cannot assume students already have the knowledge and skills to complete certain tasks. Another assumption

often held by teachers is that putting technology in front of students will some how motivate and engage them. Through students' voice, and observing them in action, it was found that technology in itself is insufficient, but there were other conditions that also needed to be met.

This study strongly suggests that students' voice has a lot to offer in terms of improving their learning experiences.. For example, one student suggested that mobile phones could be used to voice record lessons for referring back to later. This suggestion could be trialled in future lessons. Another suggestion was that the teacher take time to find out their prior knowledge about using technology, and also that the teacher give students something they can actually do (referring to using technology).

5.6 Summary

In summary, if learning conditions and outcomes are to improve for students' learning supported by current and emerging technologies, teachers need to know their students *very well*. Teachers need to know that students have expectations of how their learning should be supported by the teacher. Teachers exploring and using current and emerging technologies will need to be even more organised and prepared, and provide robust *scaffolding* in order for students to have success. It is imperative that teachers identify students' assumptions about technologies, and their own assumptions, by conversing with and obtaining students' voice on matters.

Chapter Six: Conclusion

In this concluding chapter, I revisit the purpose of this study and its significance. I summarise the key findings in relation to the research questions. Conclusions are proposed and what this means for teachers and learning programmes that are supported by mobile technology and Web 2.0 tools. Lastly, I acknowledge the limitations of the study and offer suggestions for further research.

Study purpose

The purpose of this study was to validate students' voice by allowing them to express their views on the use of mobile technology and Web 2.0, and whether they found them motivating and engaging. Literature tells us, and from my own observations as an experienced teacher, when students have a mobile device in hand they show signs of being motivated, and a phenomenon or type of 'sensory experience' takes place where students display a natural curiosity and engagement with the device through various interactions. When students have access to mobile technology and Web 2.0 their learning experience differs from traditional styles of learning. As a teacher it is imperative for me to know and understand students' learning experiences that are supported by mobile technology and Web 2.0 tools, so that I can improve the quality of these experiences within my own teaching and ensure that the ways in which mobile technology and Web 2.0 tools are used to support learning are *effective*.

Research design

This study acknowledges the importance of gathering students' voice in research, and seeking insights to the daily learning experiences of students in schools in order to improve schooling for them (Robinson & Taylor, 2007; Smyth, 2012). From an interpretative position I was interested in gathering the views and voice of students, after all, students are at the centre of their learning experiences and are therefore able to broaden and deepen our understanding of what it is like for them. For instance, I wanted to understand what it was like for students to be on the receiving end of learning supported by mobile technology and Web 2.0 (which are emerging

technologies designed for business). I wanted to know if they did indeed find it motivating and engaging using these technologies, and in what ways? If not, then why not? I wanted to find out the conditions that perpetuated or diminished their motivation and engagement. In order to settle my personal queries I felt the approach taken needed to establish open and honest communication, which meant having or building an open and trusting relationship with the participant students. This in many ways led to the logical decision of taking a case study approach that allowed me to get up close to the students. Smyth (2012) argues that if we are going to improve learning for students then we need to build a mutually trusting relationship with them and start listening to them. Robinson and Taylor (2007) also argue that transformation is an important part of gathering students' voice, schools need to listen to what students are openly and honestly telling them, and not just stop at listening, but be prepared to make changes as a result of consulting together. In regards to this study and the research school, it is hoped that what students have openly and honestly shared would be taken into account, and that the research school of which I am a staff member would be prepared to make changes in order to improve learning for students.

It is important to know that the findings in this study were specific to the research school, and involved research participants chosen as representative of its student population. How far these findings can be generalised to other learning contexts and student populations within other schools will be determined by their similarities, as found by the reader.

In search of answers to the research questions, students' voice was gathered through semi-structured interviews and observations. The use of semi-structured interviews and observations were in keeping with valuing students voice in research (Robinson & Taylor, 2007; Smyth, 2010) as they gave students time and space to be open and honest about their experiences and offer any insights that I as a teacher may have overlooked or not even considered. These methods also provided the means for conversation or dialogue between the two parties in order to negotiate and construct shared meanings, and to check on the accuracy of these shared meanings.

Summary of key findings and implications

To summarise the key findings in relation to the first question, whether *students find using mobile devices or Web 2.0 tools in learning situations motivating and engaging*, students expressed their usefulness as an overall positive experience which was found to be both motivating and engaging, however there were a number of factors that impacted upon this. In order for students have self-determination and be intrinsically motivated, the conditions for learning needed to meet students' needs for autonomy, competence and relatedness - using mobile technology and Web 2.0 gave students greater autonomy, but the role of the teacher was vital for meeting their need for competence and relatedness. The motivating aspects were evident by the interactions students were engaged in while using the technologies to support learning; these were collaborating, constructing and evaluating type interactions. Teacher scaffolding and task design are essential structures that frame interactions, and the quality of these impact on the quality of interactions. The affordances of the device and accessibility to resources beyond the learning context were also found to be useful and motivating for students. Mediational aspects suggested by students were lack of teacher support, school barriers, and technology barriers. In terms of student voice, the conversation between individual students and myself was open and sincere. Students told me what they thought and not what I might want them to say, so there is every reason to believe that the issues raised by students are in fact legitimate issues.

In relation to the second research question, *whether students' perceptions might influence their use of mobile devices and Web 2.0 tools for learning,* students' held beliefs influenced and shaped their thoughts and uses of these technologies to support learning within a school setting. Other influences on students' perceptions of these technologies were their personal knowledge and skill base, and previous experience with technologies.

The findings have several implications for teachers and the research school; these can also apply to other teachers and schools where similarities exist. First, the role of the teacher is vital in providing support for the students throughout the learning process. While this stands true for learning in more traditional settings, it is needed even more

so when using current and emerging technologies. The form of support or scaffolding needs to be as a moderator for online resources and environments, modelling of learning behaviours and practices teachers want students to emulate, and also through demonstrating the appropriate and effective uses of mobile technology and Web 2.0. Nothing should be left to chance, and the learning should be made explicit. This means teacher pedagogy needs to undergo a transformation for supporting learning in contexts supported by mobile technology and Web 2.0.

Another implication is that teachers need to know the existing knowledge and skill base of their students, concerning mobile technologies and Web 2.0 tools, in order to scaffold learning tasks so that students can have success. This also raises the issue of schools and teachers providing equity and access to digital learning opportunities for all students, and not just assume students are getting these opportunities outside of school. The way teachers can find out students' existing knowledge and skill base is to *converse* them throughout the process, being available when difficulties arise, and not leaving these opportunities for interaction and support to peers alone. How learning supported by mobile technology and Web 2.0 tools needs robust scaffolding can be an area for further research. Teachers may also need to think how they can increase students' resilience and tenacity for working in sometimes problematic and complex online environments such as Web 2.0.

Limitations

There were limitations to the study when reflecting on the research design. First, as this study was an intrinsic case study its interest was in one cohort from one school. The student participants were a numerically small group (n=6) and the study involved one teacher. The findings and suggestions from the participants are not generalisable to other cohorts or schools. However, where the reader may find similarities to their own context these findings may prove insightful and useful. The questions raised may provoke others to research within their own contexts with the goal of improving learning using these tools.

Having self-reported data from student participants can be seen as a limitation and the question should be raised as to whether students are reporting honestly, or what they believe the researcher may want to hear. I was known to the students as a teacher in the school but was not directly involved with teaching this cohort. There was no reason students could not be frank or honest in our conversations. The questions were designed to allow them to talk freely and openly, and at all times I did my best to demonstrate a sincerity and interest in their responses and suggestions. Students knew the purpose of the research was to improve learning conditions for them and future cohorts from the very first information meeting, and were reminded at the beginning of each interview.

It was originally my intention to take photographs of students while they were using the mobile devices in different situations and then use these as a reference for recollection during the second interview, but this aspect of the research study had to be discarded. While conducting observations students were relatively at ease with having me in their learning space and taking field notes, and continued on as normal. When I took photos of students working in groups and dancing, they became clearly uncomfortable with this. While I tried to remain unobtrusive by using a zoom lens students were camera-shy and began turning their back to the camera or discontinued dancing. Because I was known to the students, and positioned as an insider, we were able to converse openly and honestly about having their photos taken. Students expressed they were camera-shy and did not want their photos taken; this was the general feeling amongst all participants, and it was agreed to stop taking photos of students. Despite the fact that students did not want their photos taken, data suggests that this did not adversely affect the accuracy of findings because while the intent of taking photos was for recollection in the second semi-structured interview, the use of observation field notes was adequate.

Another limitation of the study was my intention to take screen-shots of student's work as a visual recount for discussion in the final semi-structured interview. While the idea was to gather more data in order to get a fuller picture of the phenomenon, the practical application of this required complex planning, resourcing and organising.

For most of the time students worked in groups using one iPad, and this meant retrieving screen snapshots from each iPad would have been disruptive. What would have worked better was to have obtained software that recorded the screen display in the background. After a few attempts and disruptions, the idea was discarded. Despite not being able to take screen shots of students' work, data suggests this did not affect the accuracy of findings as observation field notes provided sufficient information. In hindsight, taking photographs and screen shots was not necessary when working with a group of students this size.

Recommendations for further research

This study has prompted several areas for further research:

- The role of the teacher in terms of providing robust scaffolding that supports students' use of current and emerging technologies in learning situations
- The perspective of Maori students regarding opportunities and experiences with technologies in both formal and informal learning situations (students' perspectives)
- Profiling the characteristics of students who are motivated and engaged users of technology, and how these may be used to motivate and engage other students (students' perspectives)
- Increasing students' tenacity and perseverance for working in sometimes problematic and complex online environments like Web 2.0 (students' perspectives)
- Characteristics of learning experiences that are suited to mobile technology and Web 2.0 (students' perspectives)
- Research of this kind could be undertaken on a larger scale, involving larger cohorts of students, teachers and schools.
- Future research may also include other perspectives, including teachers and other stakeholders.

Contribution of this study

The significance of this study and its contribution to new knowledge is that this thesis

has explored and validated *students' voice* on the use of mobile technology and Web 2.0 tools to support learning. It found that there is an initial phase of excitement and curiosity that students have when using mobile technology and Web 2.0, but once this phase has passed, there are learning conditions that need to be met in order for motivation and engagement to be sustained. To sustain student motivation, which in turn leads to student engagement, students need to have self-determination. For students to be self-determining their needs for autonomy, competence and relatedness must be met. This thesis has determined that their need for autonomy can be met through the affordances of mobile technology and Web 2.0, but *the teacher's role is vital* for meeting their needs for competence and relatedness.

This study has revealed new understandings to me as a teacher that I was unaware of before the study. These understandings are a result of conversing with students and co-constructing meanings together. As a result, I now see the benefit that gathering students' voice is to teaching and learning. Some pertinent things for teaching I learned about students, mobile technology and Web 2.0 are that students' autonomy is without a doubt increased by using these technologies. The teacher and students have assumptions about using technologies, and these need investigating. Students are accustomed to having these technologies in their personal and social world as young people in the twenty-first century, but they are not necessarily accustomed to using them in learning situations and within traditional school settings. If mobile technology and Web 2.0 tools are used solely as a source of motivation for learning, then they will likely be ineffective. However, where they are an integral part of the task design and assessment and are supported by the prepared, intentional and enhanced role of the teacher they are more likely to succeed.

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Appendices

Appendix 1: Semi-structured Interview 1

INTERVIEW 1:
Describe learning experiences you have had using *mobile technology* for learning? Describe learning experiences you have had using *Web 2.0 tools* for learning? Describe other activities you have done using mobile technology? Describe other activities you have done using Web 2.0 tools?
Tell me what you believe about *mobile technology,* and how it does or does not assist your learning? *Tell me what you believe* about *Web 2.0 tools,* and how they do or do not assist your learning?
Tell me how you feel when using mobile technology for learning inside or outside of the classroom? Tell me how you feel when using Web 2.0 tools for learning inside or outside of the classroom?
Concluding Questions
Is there anything else you would like to tell me about learning with *mobile technology?* Is there anything else you would like to tell me about learning with *Web 2.0 tools?*

Appendix 2: Semi-structured Interview 2

INTERVIEW 2:
Share some *positive* experiences you have had using *mobile technology* for learning? Share some *negative* experiences you have had using *mobile technology* for learning?   Share some *positive* experiences you have had using *Web 2.0 tools* for learning? Share some *negative* experiences you have had using *Web 2.0 tools* for learning?
Could you share some ideas or experiences you know of / heard of using *mobile technology* that you have not yet had, but would like to?   Could you share some ideas or experiences you know of / heard of using *Web 2.0 tools* that you have not yet had, but would like to?   If you were to take a class, tell me the types of things you would do to make the learning experience more interesting while using *mobile technologies*? What do you think classrooms in the future (20 years from now) might look like?

What *activities* do you enjoy the *most* using mobile technology?

What *activities* do you enjoy the *least* using mobile technology?

What *activities* do you enjoy the *most* using Web 2.0 tools?

What *activities* do you enjoy the *least* using Web 2.0 tools?

<u>Tell me how you feel</u> about using mobile technology for learning?

<u>Tell me how you feel</u> about using Web 2.0 tools for learning?

If you could change anything in your learning that uses any kind of technology, what would you change?

Concluding Questions

Is there anything else you would like tell me about your learning with *mobile technology* that we have not yet discussed?

Is there anything else you would like tell me about your learning with *Web 2.0 tools* that we have not yet discussed?

Appendix 3: Observation field notes (example)

<u>Observation 2: Dance Practical</u>

1.		Students are working in the school hall, which also doubles as the Health & PE classroom. The room is very large and also includes a stage. The room echoes – not good acoustics. There are chairs scattered around its perimeter, and a set of drums, mic stands and amplifier are on the stage.
2.		Teacher recaps learning intentions and expectations for working in two groups
3.		Expectations included getting iPads set up quickly, and focusing on the tasks at hand, and groups are reminded of their deadline getting closer so they need to "get cracking and get the job done."
4.		Part of their learning intention is to find the origins of their dance, and teacher reminded students of this.
5.		Students disperse into their groups, Group 1 is working on stage, Group 2 moves to the left side of hall.
6.		Teacher approaches me and says "it's hard to stand back and not take over."
7.		Group1 includes Mervyn (6mm), Wilson (7mm) and three other non-participant students whom we will name Tai, John, Luke (not their real names).
8.		Mervyn grabs iPad, turns it on and retrieves dance video clip which is a YouTube video, he does this with apparent ease.
9.		All participants huddle around screen watching, listening. This lasts about 60 seconds then each one breaks away, and attempts dance moves. Mervyn keeps hold of iPad and watches screen, looks at group members, looks back at screen.
10.		All members of group refer back to screen to 'check' their dance moves with the original dance moves, Mervyn is still holding device.
11.		iPad acts as a music and video player resource.
12.		Music is sourced from YouTube.
13.		Mervyn pulls out iPod and plugs into amplifier set on stage, finds dance track, dance track is played quite loudly. He controls iPod, pausing and playing and pausing again.
14.		Group1 practice moves, then show their moves to other group members, this happens in a random and spontaneous way rather than a systematic way.
15.		Luke to John: "Hey watch this!" shows moves
16.		John to Luke ,Tai, Wilson: "Let's do this" shows moves

Appendix 4: Principal information and consent form

Patricia Vesey
Box 59 Kaikohe
trishvesey@gmail.com
021 501810

Masters Research Project:
Students' voice on mobile technology and Web 2.0 tools for learning

16 July, 2012

Dear Ray Melrose,

My Master of Education research project involves **'exploring students experiences and views of using mobile technology and Web 2.0 tools for learning**. I am preparing to embark on my data collection phase and would like to consult with a small group of secondary students about their views and use of mobile technologies. I have had preliminary talks with staff member Crystal Fallows, and once permission is granted from you then dates can be made for data collecting.

It is anticipated that students would be asked to participate in two video/audio-recorded *interviews* - the earliest in July, and again some time in August/September. The two interviews would last 30 minutes and 40 minutes at maximum, and would be conducted during school hours in Room Narnia. I would also like to make *observations* of the same students using mobile technology and Web 2.0 tools. As part of the observations I will be taking video recordings for collecting data, but not for public viewing. Also, I would like to take photographs of students in action and screen shots of their work. The photographs and screenshots will be used as visual reminders during interviews. They may also be used in educational presentations and publications. Again, I will be making observations some time between July and September.
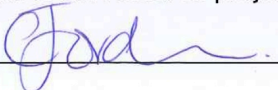
Both parents and students will receive information outlining the project, and consent forms for students to participate. Please feel free to ask me any questions.

The University of Waikato Faculty of Education Research Ethics Committee has reviewed this research project, and given consent for it to be undertaken. Any concerns or disputes about this research, please contact my supervisor:

Dr Garry Falloon
Department of Professional Studies in Education
The Faculty of Education
The University of Waikato, Hamilton
tel: 07 838 4466 ext 6553, email: falloong@waikato.ac.nz

Yours Sincerely

Patricia Vesey

I *Ray MELROSE* give permission for Patricia Vesey to carry out data collections in our school as part of her research project.

_____ (principal's signature)   *17/7/12* (date)

KAIKOHE CHRISTIAN SCHOOL
52 MANGAKAHIA ROAD
KAIKOHE

Appendix 5: Teacher information and consent form

Teacher & Researcher Trish Vesey, Cell 021501810, Home 094053330, Email trishv@kcs.school.nz

April, 2012

PROJECT INFORMATION FOR TEACHER

Project Title: Students' Voice on Mobile Technology and Web 2.0 Tools for Learning

Dear Crystal Jordan,

My Master of Education research project involves **'exploring students experiences and views' of using mobile technology and Web 2.0 tools for learning**. I am preparing to embark on my data collection phase and would like to consult with a small group of secondary students about their views and use. As you are the teacher in charge of the students I would like to consult with and gather data from, I need your consent to do so. Once permission is granted from you then dates can be made for data collecting.

It is anticipated that students would be asked to participate in two video/audio-recorded *interviews* - the first in June, the second in August/September. The two interviews would last 45 minutes at maximum and would be conducted during school hours. I would also like to make *observations* of the same students using mobile technology and Web 2.0 tools. As part of the observations I would like to take video recordings to gather information (not for public viewing). Also, I would like to take *photographs* of students in action as a visual narrative. Again, I will be making the observations some time between June and September. As a teacher/researcher I am seeking to cause as least disruption to their learning as possible.

Both parents and students will receive information outlining the project, and consent forms for students to participate.

The University of Waikato Faculty of Education Ethics Committee has reviewed this research project. Any concerns or disputes about this research, please contact my supervisor:

Dr Garry Falloon
Department of Professional Studies in Education The Faculty of Education
The University of Waikato, Hamilton
tel: 07 838 4466 ext 6553
email: falloong@waikato.ac.nz

Yours Sincerely Patricia Vesey

I _Crystal Jordan_ give permission for Patricia Vesey to carry out data collections as part of her research project: **'Students Voice' on Mobile Technology and Web 2.0**

_____ teacher's signature   5-4-12.___ date

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Appendix 6: Student consent form – research participation

Patricia Vesey
Box 59 Kaikohe
trishvesey@gmail.com
021 501810

Masters Research Project:
Students' voice on mobile technology and Web 2.0 tools for learning

Student permission – research participation

I confirm that I have read and understand the outline of the research project and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without consequence.

I understand that I will not be identified by name in any publications arising from the research, unless I give my express permission.

I agree / do not agree (tick as applicable) to take part in the research.

- ❏ I consent to data being collected from me through audio-recorded interviews

- ❏ I consent to data being collected from me through video-recording

- ❏ I consent to data being collected from me through photographs

- ❏ I consent to data being collected from me through screen shots of my work

Student's name: _____

Student's signature: _____   Date: _____

(1 for student; 1 for researcher)

Appendix 7: Parent / Caregiver consent form – research participation

Patricia Vesey
Box 59 Kaikohe
trishvesey@gmail.com
021 501810

Masters Research Project:
Students' voice on mobile technology and Web 2.0 tools for learning

Parent / Caregiver permission – child's research participation

1. I confirm that I have read and understand the outline of the research and have had the opportunity to ask questions.

2. I confirm that I have discussed the research with my child and are satisfied they are making an informed decision.

3. I understand that my child's participation is voluntary and that they are free to withdraw at any time, without giving any reason and without consequence.

4. I understand that my child will not be identified by name in any publications arising from the research, unless I give my express permission

5. I agree / do not agree (tick as applicable) for my child to take part in the above study.

  ❑ I consent to data being collected from my child through audio-recorded interviews

  ❑ I consent to data being collected from my child through video-recording

  ❑ I consent to data being collected from my child through photographs

  ❑ I consent to data being collected through screen shots of my child's work

Student's name: _____

Parent/Caregiver signature: _____   Date: _____

(1 for parent/caregiver; 1 for researcher)

Appendix 8: Student consent – photos and work screen shots

Patricia Vesey
Box 59 Kaikohe
trishvesey@gmail.com
021 501810

Masters Research Project:
Students' voice on mobile technology and Web 2.0 tools for learning

Student permission – photographs / screen shots of work

I understand that photographs or screen shots of work, that may identify me, may be used in educational presentations and publications.

I understand that I do not have to agree to the use of photographs or screen shots of work, which may identify me, being used in any presentation or publication.

I agree / do not agree (tick as applicable) to photographs or screen shots of work being used, which may identify me, in any presentation or publication.

- ❏ I consent to photographs that may identify me, being used in educational presentations and publications

- ❏ I consent to screen shots of my work that may identify me, being used in educational presentations and publications

Student's name: _____

Student's signature: _____   Date: _____

(1 for student; 1 for researcher)

Appendix 9. Parent / Caregiver consent – photos and work screen shots

Patricia Vesey
Box 59 Kaikohe
trishvesey@gmail.com
021 501810

Masters Research Project:
Students' voice on mobile technology and Web 2.0 tools for learning

Parent / Caregiver permission – photographs / screen shots of work

I understand that photographs or screen shots of work that may identify my child might be used in educational presentations and publications.

I understand that I do not have to agree to the use of photographs or screen shots of work, which may identify my child, being used in any presentation or publication.

I agree / do not agree (tick as applicable) to photographs or screen shots of work being used that may identify my child in any presentation or publication.

- ❏ I consent to photographs of my child being used in educational presentations and publications

- ❏ I consent to screen shots of my child's work being used in educational presentations and publications

Student's name: _____

Parent/Caregiver signature: _____ Date: _____

(1 for parent/caregiver; 1 for researcher)

Appendix 10: Ethical approval to conduct research

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

MEMORANDUM

To:	**Patricia Vesey**
cc:	Dr Garry Falloon
From:	**Associate Professor Linda Mitchell** Chairperson, Research Ethics Committee
Date:	31 May 2012
Subject:	Supervised Postgraduate Research – Application for Ethical Approval (EDU045/12)

Thank you for submitting the amendments to your application for ethical approval for the research project:

Students' voice on mobile technology and Web 2.0 tools for Learning

I am pleased to advise that your application has received ethical approval.

Please note that researchers are asked to consult with the Faculty's Research Ethics Committee in the first instance if any changes to the approved research design are proposed.

The Committee wishes you all the best with your research.

Linda Mitchell

Associate Professor Linda Mitchell
Chairperson
Faculty of Education Research Ethics Committee

Appendix 11: NZQA Physical Education expressive movement task

PHYSICAL EDUCATION
Demonstrate expressive movement

level:	3
credit:	3
planned review date:	December 2003
sub-field:	Health and Physical Education
purpose:	People credited with this unit standard are able to: demonstrate movement vocabulary in performing the selected expressive movement form; demonstrate knowledge of a selected expressive movement form; and perform and review an expressive movement sequence.
entry information:	Open.
accreditation option:	Evaluation of documentation by NZQA.
moderation option:	A centrally established and directed national moderation system has been set up by NZQA.

special notes:

1   The content in this unit standard has close association with the achievement objectives in the *Health and Physical Education in the New Zealand Curriculum* (Learning Media, Ministry of Education, 1999).

2   Select a specific expressive movement form.

3   *Expressive movement forms* are movements performed in sequence from a range that may include but is not limited to aerobics, rhythmic gymnastics, gymnastics, synchronised swimming, acrobatics.

4   *Movement vocabulary* refers to the essential vocabulary of the expressive movement form.

5   Group performance or solo work may be used as assessment event(s) but assessment must ultimately be based on individual presentation of the expressive movement sequence.

6   The length of the expressive movement presentation required is three to five minutes in duration.

PHYSICAL EDUCATION
Demonstrate expressive movement

Elements and Performance Criteria

element 1

Demonstrate movement vocabulary in performing the selected expressive movement form.

performance criteria

1.1   Movement vocabulary is identified that relates to the expressive movement form.

        Range: locomotor and/or non locomotor skills;
                    combinations;
                    variations in use of space, time, dynamics.

1.2   Movement vocabulary of the expressive movement form is demonstrated in a physical activity setting.

        Range: evidence of four locomotor and/or non locomotor skills and/or combinations;
                    evidence of variations in use of space, time, dynamics.

1.3   Movement sequences are reproduced in response to visual and/or aural instruction.

1.4   Demonstration includes an explanation of the relationship between relevant rhythms and the expressive movement form.

        Range: examples are - metered rhythm, non metered rhythm, internal rhythm, accent, timing, responding to sound cues.

element 2

Demonstrate knowledge of a selected expressive movement form.

Range: one of written, oral, visual, combination.

performance criteria

PHYSICAL EDUCATION
Demonstrate expressive movement

2.1   Demonstration describes the significance of the selected expressive movement form.

2.2   Demonstration describes the background context of the expressive movement form.

   Range: evidence of one of - cultural, social, historical, geographical, political, artistic, therapeutic, spiritual, recreational, competitive.

2.3   Demonstration defines the origins of the expressive movement form from beginnings to present day.

   Range: origins may include but are not limited to - improvisation from a stimulus, motif development and variation, development of movement phases.

element 3

Perform and review an expressive movement sequence.

Range: performance may be in a group, with a partner, or solo;
          sequence will be between three and 10 minutes;
          performance will be in front of an audience, which may include a workshop or classroom setting with fellow students as the audience.

performance criteria

3.1   Movement vocabulary and movement patterns of the expressive movement form are performed in a predetermined sequence.

3.2   Safe practices are demonstrated within a movement sequence environment.

   Range: safe practice may include but is not limited - to warm up, warm down, managing equipment, working co-operatively.

3.3   Performance of expressive movement sequence demonstrates evidence of rhythm, space, energy, purpose and focus.

3.4   Review performance of a selected expressive movement sequence.

   Range: oral and/or written.

PHYSICAL EDUCATION
Demonstrate expressive movement

Comments on this unit standard

Please contact the NZQA National Qualifications Services nqs@nzqa.govt.nz if you wish to suggest changes to the content of this unit standard.

Please Note
Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0226 which can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Appendix 12: Level 1 coding of Interviews (example)

Semi-structured Interview 2: Mervyn (7mm)

LEVEL 1 CODES

Semi-structured Interview 2: Mervyn (7mm)

Appendix 13: Broader coding of categories (example)

interactions

accessing	internet, music, wireless	7mm
finding resources		
planning	iPads	
playing music	group	
problem solving	google, YouTube	
searching		
building content		
self-assessing	iPad, like a mirror	
using own iPad	iPad	
video recording		
accessing	music, videos	2fm
developing ideas		
discussing		
improving	iPad like a mirror	
reviewing		
recording		
self assessing	moves, recordings	
multi-iPad use		
videoing	own performance	
accessing		4me
chilling	made easy	
comparing	own dance moves to video dances	
leadership	competent users	
correcting	iPad like a mirror	
viewing ourselves		
leading		
learning outside of classroom		

technology interactions
collaborative interactions
evaluative interactions
locating interactions

constructive i
evaluative int
collaborative

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