Video conferencing in early childhood education: Teachers' perspectives

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Table of Contents

Abstract

"Today's children are growing up in a rapidly changing digital age that is far different from that of their parents and grandparents" (National Association for the Education of Young Children & Fred Rogers Center, 2012, p. 1). With such changes within communities, and globally, partly due to nearly constant increases in digital technologies available, it is important for the education sector to continually reflect on their practices. Seeking ways to appropriately incorporate or adopt new technology (digital or otherwise) into the education system will always be a relevant, interesting, and sometimes difficult and challenging, topic (Allen & Blake, 2010). One tool of digital technology is video conferencing – the use of visual and audio technology to communicate with others via the internet. This particular tool is being explored in many areas, from holding meetings with participants in different geographical locations, to those with families so they can remain in closer contact while travelling, or if they live at distances from each other. This aspect of technology combines elements of community building, communication, and otherwise impossible exploration, while remaining distant and remote from the other party.

The curiosity of this researcher was sparked by personal experience and knowledge of video conferencing and wondering how it would relate to an early childhood setting. This research aims to aid teachers and centres who are considering, or already implementing, video conferencing in their practice, by providing some of the possible benefits and downfalls it may have when used within early childhood education. This small scale study looks at the perspectives of a few teachers on digital technology within society, digital technology within early childhood education, and video conferencing in early childhood education, to reflect on the question of what teachers' perspectives could be around the possibilities of using video conferencing within early childhood education. As digital technology and its tools are changing society, it is important that the education sector reflects on what tools are available for children's learning, with attention given to the possible implications, both positive and negative, to children's growth and development in all areas. There is a need for continual questioning in regards to 'digital childhoods', with the understanding that there may never be a definitive, or one universally correct answer, with more value being gained from a constant purposeful approach and ongoing questioning of practices (Gibbons, 2015). Education settings need to be reflecting critically on how and why they are using digital technology in their practice, not only in terms of educational goals, but also as resources within the setting (21st Century Learning Reference Group, 2014). It is also important for teachers of young children to remain mindful of what children already know and what type of world children are a part of outside of the centre, and to create environments within their centres that reflect what is important to those children, families, and societies, while maintaining their professional reflections on what is important within their

early learning setting, and why. Part of a teacher's role is to reflect critically on what they are doing, the learning environments and opportunities they are providing or inhibiting, and why they are doing things the way they are. "If we are to grow and develop as individuals, and contribute to significant issues in the field of early childhood, we must think back on what we do and why we do it" (Arthur, Beecher, Death, Dockett & Farmer, 2005, p. 118).

This research provides a way for the teachers involved in it, to reflect on their own practice and share that with others. It allowed them to have different topics raised and brought to the forefront of their minds, so they could think more deeply about their practice and what it meant for them as individuals, for the centres and children whose learning environments they contribute to, and where their beliefs sit within their communities. Key themes revealed through the interviews included a shared understanding that digital technology is part of the future for children. Teachers participating in the study generally felt digital technology should only be used for academic tasks within the centre environment. They had some understanding of the importance of the wider community in the lives and education of young children, but limited ways to connect the centre and the wider community; they also held the attitude that they would be willing to implement video conferencing within their centres if they saw a purpose. Within the early childhood sector in New Zealand, all early childhood education settings are required to adhere to *Te Whāriki*, the early childhood curriculum of New Zealand. As well as the national early childhood curriculum, each centre has its own philosophy which will impact on how and why that centre and its teachers implement the use of digital technology and video conferencing within the learning environment. As with any decisions made in early learning centres, decisions around digital technologies and video conferencing, and their place within individual settings, need to be made by each centre, based on relevant information available, teacher beliefs, the centre's philosophy, community values, and the national curriculum. The intention of this research is to highlight the perspectives of a few teachers as a starting point for further research on the possibilities of video conferencing, as well as starting conversations amongst teachers about what video conferencing could mean as a tool within early childhood education settings.

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Desiré Purnell

Introduction

Children today are growing up "… as global citizens in a rapidly changing and increasingly connected world…" (Ministry of Education, 2017a, p. 7) where they are required to develop an understanding of how to learn. Information is easier to obtain and as the world changes the skills required to participate as valued members of society change. With an information-rich world, learning to obtain and use information is becoming as much of a skill as finding the information itself. The use of digital technology allows children to find different information from a range of sources (Winsor & Blake, 2010), and they can do it quickly and easily using the internet (Breck, 2002; 21st Century Learning Reference Group, 2014) which allows them to build a bigger picture of various ideas and points of view as well as encouraging further questioning and information gathering. Video conferencing is one way that children can gain information through the ability to engage in conversations, and sometimes be shown examples of what the other party is talking about, even when there is a geographical distance between them. Young children can use video conferencing to question another person at a distance, share their ideas and opinions, seek further information, and develop ways to understand another person's perspective. Video conferencing can allow children to become active participants in information sharing in a new and different way. The New Zealand Early Childhood Curriculum, *Te Whāriki*, sets out the expectation that teachers treat children as learners who are capable of learning, and who should play an active part in their learning (Ministry of Education, 2017a), but young children have not always been viewed this way.

As society develops, and the available tools and resources develop and change, new ideas and concepts are developed which are not always popular. For example, in the early eighteenth century, John Locke suggested that children were not born as sinful beings who needed strict discipline to learn proper, moral behaviour as was the thinking of the time (Drewery & Bird, 2004). Rather, Locke presented the idea that children were as a 'blank slate', needing thoughtful education to become moral adults (Drewery & Bird, 2004). Children build knowledge and character through experiences they have within their environment and through what they learn from their parents, according to Locke (Berk, 2003). In his work, Locke proposed that children acquire information in a sequence. For example, they are spoken to and learn verbal language before they can read, building on their knowledge and skills a bit at a time, rather than through being forced to learn through rote learning and discipline (Locke, 1693). While Locke's' ideas have been influential, they would have no doubt been unpopular at the time he made his views known, as he was challenged and criticised by some (Locke, 1693). Locke's views have continued to be challenged as society has changed and knowledge has changed. As knowledge has developed, so has an understanding that children are born with genetic traits and innate knowledge, rather than being a completely blank

slate as suggested previously (Wong, 2005). This is an example of how ideas and popular beliefs can change with more information and further reflection. New concepts and ideas can be used to alter previous assumptions or ideas. The added knowledge of genetics playing a part in how children grow and develop means that while they may be capable of learning what is taught to them, they are mostly likely not completely devoid of inherent ability.

Digital technology is an area that has been, and continues to be, developing at a rapid rate (Wong, 2005). Just as new ideas, such as those held by John Locke, seemed to be unusual, perhaps even viewed with suspicion, new technology can create the same reaction. Often with new ideas and tools, there will be those who embrace the technologies and become experts, and those who are less able to accept or understand the changes (see for example, Booch, 2016; Breck, 2002).

The introduction and growth of digital technology within society has resulted in discussion around what is appropriate and what is not in terms of the development of young children. There have been warnings around the harmful effects of different aspects of digital technology if children are exposed too often, when they are too young, or for too long at one time. There have also been some benefits noted through the use of digital technology, including the idea that, "ICT (i.e. Information and Communications Technology) may provide unique opportunities for scaffolding and supporting children with special learning needs, or children from culturally or linguistically diverse backgrounds" (Bolstad, 2004, p. 32). Like many other developments and changes throughout history, there are both positive and negative aspects to digital technology that are discussed in the literature. This research looks at the perspectives of early childhood teachers, and as there are differing opinions within society, there may be different opinions among teachers. Finding out these perspectives is an important part of the dialogue around what is believed to be best practice and why.

In this research project, the views of early childhood teachers on digital technology within early childhood settings are explored. The project began with contemplating where digital technology sits within early childhood settings in New Zealand today. Through reading and discussion during a class that I was a part of during my studies which was looking at digital technology in education, the idea of video conferencing and its possibilities came up. Various questions arose in my mind. Why have I only experienced computers sitting in the corners of centres and not being utilised in my ten years of teaching, when children in some schools are beginning to use digital technology in so many ways? In what ways do my own children use digital technology? I had been involved in discussions between various 'experts' in particular fields and how technology can allow for different learning experiences that were not accessible before video conferencing was invented –

such as talking to and seeing what life is like on the space stations orbiting Earth. As literature was gathered, the scope of information gathered was extended to include current theories of, and beliefs around, digital technology in general. It became apparent that the views of one particular tool of digital technology could not be fully explored without looking deeper into topics associated with digital technology in general.

For this particular project, the research question asked what early childhood teachers' views of video conferencing were. The project takes the viewpoint that teachers' ideas, understandings, beliefs, and opinions are of high importance. The reason for this viewpoint is partly because of the researchers' background as an early childhood teacher, and the knowledge that it is the teachers who deliver the curriculum and learning experiences for the young children in their care. Children's learning experiences using digital technology are influenced by teachers' pedagogical understandings and the quality of a teacher's interactions with the children and with the technology (Hatherly, Ham, & Evans, 2009). The way teachers feel about digital technology in an early childhood centre is likely to reflect on the way it is incorporated, or not, within that centre. The second reason for this viewpoint is the understanding that teachers need to feel that their beliefs, understandings, and opinions are valid and worthwhile. Teachers' views influence their practice and the way they deliver the curriculum (Gibbons, 2010; Winsor & Blake, 2010). If their views are influencing the way the centre operates and the learning experiences of young children, then those views need to be heard and understood. Teachers need to feel that their voices are important. Therefore, when looking at video conferencing and its relevance to early childhood education, teachers have a right to talk about it, and the topic should be explored in terms of what those who implement the curriculum believe.

This research project came about because of my interest as a teacher of young children. Within my ten years of teaching, I have not observed any great movement in the types and ways digital technology was, and is, being integrated into early childhood education. In my experience, there have not been meaningful conversations within some centres around the possibilities of using (or not using) digital technology in a meaningful way with children. It appears, in my experience, to be an area that is largely unexplored from a practitioner's point of view. With the lack of experience of digital technology in practice, it has been very interesting to me personally, to find out how much work has been done in the past, and continues to be done, around theory relating to digital technology in education. There also appears to be a lack of information on how to integrate digital tools in meaningful ways to support learning, if that is the wish of the centres. Or perhaps the issue is really a lack of knowledge around where to access this type of information, or a lack of deep reflective practice being undertaken by teachers. These are questions that have been raised for

myself personally during this research, and questions that are looked at in this research project. For all of the information that I thought I was accessing and the reflections I thought I was doing as a practising teacher, I have been very surprised by what I did not know and what I was not considering when I began this journey into academic research.

It is important to explain some of the definitions of digital technology and why digital technology is important, so chapter 1, entitled 'Defining the contemporary digital world', will address these topics. This chapter outlines the definitions and meanings of 'digital technology' and other commonly used terminology. There is discussion on the history of technological development, how digital technology and the world are both changing, and the possible effects of digital technology on the future. The chapter also looks at what knowledge means in a digital world, what type of world children are growing up in with the influence of digital technology, and what is meant by a 'digital divide'. The chapter gives a broad background of why digital technology is important and relevant to today in a very general way. In order to fully understand the relevance of one tool of digital technology, such as video conferencing, it is important to understand the impact digital technology has had, and continues to have, on the world around us. This chapter explores the idea that digital technology is embedded in the everyday lives of many, and that the world children are experiencing is filled with the advancements of digital technology (McPake & Plowman, 2010). This is to discuss the idea of how society currently operates within daily life and where digital technology is placed within the world in general, and some of the possible implications this has for the experiences children and families have of the world around them.

The general ideas and understandings of digital technology and current practice within early childhood settings are explored in chapter 2, 'Digital technology in early childhood education today'. Within this chapter, theory around what digital technology means for the education system, and how different environments are linking children's learning, are discussed. There is a discussion about digital technology in relation to *Te Whāriki*, the early childhood curriculum of New Zealand, and in relation to other curriculum approaches, including the new digital technology curriculum for New Zealand education. Digital technology is discussed in terms of other theories that are relevant to early childhood education and where digital technology sits, as well as what digital technology could mean for diversity in education. Beliefs around the positive possibilities and concerns associated with digital technology are addressed, along with the importance of cyber-safety while using digital technology with young children. Teachers, teaching practices, teacher training, and professional development is looked at in relation to the impact these people and practices have on the use of digital technology within early childhood education settings. It has been suggested that in terms of digital technology used within early childhood education, teachers who are lacking

guidance, decide on their own how and when to use it (Bolstad, 2004). This would suggest that the teachers' ideas, beliefs, and understandings are one of the key factors, so the chapter looks at the research and literature around such ideas. Within this chapter, one of the factors that is looked at is the effects of introducing more digital technology to pressures already felt by teachers and centres, and these pressures affect the philosophies and curriculums in early childhood settings. If education is a vehicle for teaching about culture (Allen & Blake, 2010), what is the learning culture being set up for children to learn and grow in their early years within early childhood education settings?

Video conferencing is a way of communicating using audio and video. With computers, microphones, cameras, and the internet, conversations can be held between people in different geographical locations while being able to see, hear, and speak to one another. The specific topics associated with video conferencing are discussed in chapter 3. The definition of video conferencing is explained further, followed by a closer look at possible benefits and challenges of video conferencing. How young children are able to use video conferencing and how video conferencing is currently used within early childhood education services is explored with reference to recent studies and current understandings. The possible uses of video conferencing in the future of early childhood education and where video conferencing sits within *Te Whāriki* is looked at. Video conferencing adds more dimensions to long distance communication by allowing participants of the interaction to see gaze and gestures (Kelly, 2013) but the question remains as to whether it is appropriate or useful for young children. This chapter also looks at some of the literature around these topics, with the goal of gaining a better understanding of video conferencing and the implications of its use.

In chapter 4, the research design for this project is explained, along with why particular choices were made and how these choices impacted on the project. This research sits within the qualitative category, as it looks at the experiences and perspectives of participants in a broad and holistic way. The research takes a phenomenological approach as it is based on the understanding that "Human experience is characterized by complexity, and social science researchers need to work with theories and methods that take account of this" (Somekh, Burman, Delamont, Meyer, Payne, & Thorpe, 2011, p. 2). As a teacher, I believe that those delivering the curriculum and implementing the practices within centres are the ones who need to be heard and understood more, as they are the key players in the quality of early learning settings. The views of teachers can influence how they teach and the experiences they offer for children, and as such their voices need to be heard. The process of collecting relevant literature has aided in the formulation of questions, to ensure the information asked of participants builds on what is already known within the sector.

In chapter 5, the findings are presented. In this chapter, details of information shared by participants during their interviews are given, but with little time given to exploring the links between the literature reviewed in pervious chapters and what was revealed by the participants. The findings give an insight into what some teachers are facing and how they are approaching their practice with the increase in digital technology and the prospect of new ways to implement the curriculum within their professional practice. Some of the information presented here includes what digital technology teachers are currently using within their practice, what they are using at home, what they believe the importance of community is, and how they currently interact with their communities. The use of video conferencing can allow for communication with people in different geographical areas in different ways, so finding out the teachers' views on community building and connections with the wider world was important. Through summarising the information given by individual participants, themes can be found, which allows for a thematic analysis of the data as a whole. This makes the voices of the individuals come together to build a bigger picture. The themes are summarised at the end of the findings chapter.

Chapter 6, entitled 'What does it mean', explores what the findings from the participants may mean in relation to other literature. In discussing the information gained from participants in this study, it was found that the findings supported those of some other researchers or theorists, reinforcing those ideas. Information gathered from participants shows some variation between the information gathered in this study and that gathered in other studies, such as the idea from one participant that parental permission would be needed to use video conferencing within the centre. Another aspect that arose in the discussion was the idea that this research project has the ability to bring forward ideas and concepts that may not have been considered previously. One of the biggest assumptions that I found within the literature as well as with discussions with teachers during interviews, is the idea that older teachers are less experienced and confident with digital technology, yet when I looked at my findings I discovered that one of the oldest teachers I interviewed expressed the greatest confidence and willingness to learn and grow with digital technology. In this discussion chapter, information from the participants is analysed using information from the literature review in a thematic way.

While this research project has been a small scale research project, it is hoped that it will add important information to the body of knowledge available for teachers, and start conversations on what teachers believe, and why, in relation to video conferencing with young children. Digital technology affects the lives of children daily so it is important to know what teachers believe about their role in exposing and utilising digital technology, and what potential there may be for video conferencing. Teachers are the most important resource available within an early childhood setting

and their views and beliefs shape the centre environment and learning opportunities available for young children. Before ideas on how to implement video conferencing are even approached, the views and opinions of the teachers themselves need to be discussed and considered, along with the reasons behind those ideas. As with many areas of life, there are deeper issues, and one solution or ideal may not fit every centre or every community. The values of the teachers and the communities they work in must be taken into consideration, as well as the positive and negative effects possible from introducing new ideas and new digital technologies into the centres' curricula. With this research project, it is hoped that through the literature reviewed and data collected, ideas on what is possible and probable within centres will be challenged and teaching practices will be questioned through self-reflection. The idea is to look at possibilities and to provide instigation for professional reflection of practices. This was the basis that led the researcher to conduct the research in the first place, and it is the hope that the completed project will inspire the same interest in reflection for other teachers and managers of early childhood settings.

Chapter 1: Defining the contemporary digital world

1.1 Introduction

Within the world, technologies change, meaning that the way we live our lives alters. Current culture in New Zealand, according to the Ministry of Education, is that "New Zealand is a digital nation. Digital technologies are transforming how we live, shaping our homes and our workplaces, and changing the way that we interact with each other and live our everyday lives" (Ministry of Education, 2017b, p. 4). This definition is relevant to this research as it relates to the place the research was conducted, is a current definition given by a governing body of the country, and expresses the idea that change is not a past concept alone, but is also a current issue to consider.

This research addresses the topic of digital technology in education, beginning with some definitions of what digital technology means. The chapter looks into the past of human technology, discussing how the world is changing, and contemplating what the world may look like in the future. Part of the aim of this research project is to give a picture of what is known and believed by some practitioners today, to help with future decision making and practices. There is a view that the culture of a society is the basis for the construction and passing on of knowledge of that culture (see for example, Wong, 2005), so as the Ministry of Education has made the recent determination that New Zealand is a digital nation, this chapter looks at what knowledge could mean in a digital society. Within this digital nation, adults may use their knowledge from the past to base their ideas of what children need to know and learn, on how the children are able to experience the world (McPake & Plowman, 2010); a view that is relevant when looking at digital technology in early childhood education, because technology develops and changes from each generation. Within this chapter the topic of what is relevant to today's children and their development of knowledge is also explored. While there are many generalisations around what is important, as with many aspects of the world, there are possibilities for division within society; the term 'digital divide' is a term used to describe the possible inequities created by the increase of digital technology available only to some (21st Century Learning Reference Group, 2014). The possible digital divide is discussed in this chapter, exploring the topic from different understandings of what it could mean, including socio-economic issues and different levels of access to resources. This chapter sets the scene for the importance of this piece of research as it describes the context of the wider world that this research is contributing to. It also highlights the changing digital world which creates more of a need for research that looks at aspects of digital technology within the definitions of both current world views and the potential future for children growing up now. There is likely to be continued debate as changes in digital technology continue to occur (McDonald, Nutkins & Stephen, 2013). Research such as this project are likely to not only add to the greater body of research available, but also

encourage those involved with early childhood education to reflect on a variety of issues relating to digital technology within the early learning sector.

1.2 Digital technology definitions

Before going any further, it is critical to define some of the terms as they are described in literature, as well as how they are used within this project. This will allow for the meaning to be clear throughout this thesis. The definitions will be given first, followed by a brief description of what the terms mean in this document.

'Technology' is a word that has been used in a similar way through history since it emerged. It is complex because it involves many different aspects of life, and implies thought on the value status of human tasks. "The idea of 'technique' emanated from the Orient as 'practical application', a means for living in the world" (Gibbons, 2007, p. 2). During the time of the Ancient Greeks, the meaning extended from a reference to practical tasks that were thought to require little intelligence, to complex thinking about the ways in which societies operated, and further extended during the eighteenth century to included technical knowledge in skilled areas such as science, education, and engineering (see for example, Gibbons, 2007). This illustrates that the term 'technical' has gone from originally meaning practical tasks that were thought to require little skill or intelligence, to meaning tasks that require specific skills and knowledge in a particular area, but it has retained its reference to human activity within society.

More recently, technology has been described by the Ministry of Education as, "…invention by design" (2017a, p.11), further defined as, "…critiquing past, existing and possible future technologies, while considering their environmental, social and cultural impact" (p. 4). Technology can be viewed as the ideas and relationships between humans and things, such as the interactions between a child and his or her toys or activities (Gibbons, 2007). These definitions suggest that the term 'technology' is more a way of thinking about things than it is an object, or type of object. The definitions given by Dictionary.com (2019) include, "…the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, drawing upon such subjects as industrial arts, engineering, applied science, and pure science…", and "…the sum of the ways in which social groups provide themselves with the material objects of their civilization". These definitions also suggest that technology is also a way of doing tasks, achieving goals and purposes, and reflecting on societies. The definition of 'digital', is given in Dictionary.com (2019) as, "of, relating to, or using data in the form of numerical digits: a digital image; **digital devices** (emphasis in original text)" and "available in electronic form; readable and manipulable by computer". These definitions suggest that 'digital' refers to an electronic form of

data. Combining the two definitions leads to the possible definition of digital technology being a way of incorporating electronic devices and means when thinking critically about societies and how they have operated in the past, present, and will operate in the future. 'Digital technology' could be described as the means by which current understandings of human past, present, and future are reflected upon and defined.

Digital technology is often referred to without mention of the word 'digital', which can lead to misunderstandings about the differences between digital technology and technology in general. Morris, Izumi-Taylor, Smith and Winsor suggest technology, "refers to the application of science to create products or to solve problems, including computers, fax machines, cell phones, digital cameras, overhead projectors, PowerPoint, tape recorders, video cameras, TV, VCRs, electronic or digital devices, etc." (2010, p. 152). This highlights the way digital technology is confused with technology in general. The description given by Morris et al. actually refers to items which are more often than not, pieces of digital technology. The term 'digital' has been left out, leading the reader to believe that digital aspects of technology are the only relevant forms of technology available.

Another term that has been widely used within early childhood education is 'ICT', or information communication technology, which can include digital cameras, electrical musical instruments, video conferencing, closed circuit television, as well as computer hardware and software (see for example, City of Manukau Education Trust, 2005).

In this thesis, the term 'digital technology' is preferred to 'ICT', as it more specifically describes what is being discussed –the ways that society uses, and could possibly use or discard, the electronic devices available in today's society. This research explores what teachers' perspectives of one aspect of digital technology are, and as such, the term 'digital technology' is the most relevant term to use.

1.3 Technology of the past

The knowledge built up in history is argued by some, including Ozmon and Craver (2003) to be an important factor in understanding the present ideas held by an individual. In order to understand digital technology of today, it is helpful to look at the past and how technology has evolved over time.

Technology, and the understanding of technology, has changed and transformed over time as society has changed. If the definition of 'technology' is related to activities of human societies, then technology can be seen right throughout human history. One aspect of technological evolution can be said to be the presence of a motive –as in the purposeful use of an object as a tool (see for

example, Campbell, n.d.). Further to this, the philosopher Jean-Paul Sartre believed that change is the direct result of human activity, and as such it can neither be good nor bad, even though humans assign meaning to it (Ozmon & Craver, 2003). The evolution of technology can be seen to be the result of humans' trialling of new ideas or extending current concepts to create new understandings. Campbell pointed out that while the use of stone tools is evident from around two million years ago, they would have been used in a more limited way before that. This is an example of how technology has grown and developed over time as human knowledge and skill has grown – today's stainless steel blades, carefully moulded and planned are evolved from stone blades, equally carefully crafted over two million years ago.

Similarly, ball point pens used today to mark ideas and thoughts on paper have evolved from pen and paper created around 1000AD (see Doyle, 2017). Prior to this there were still ways of communicating thoughts, ideas, and events, but they were communicated in different ways including through the use of paintings on the walls of the cave people.

1.4 A changing world

Change occurs as societies evolve, causing a degree of uncertainty and fear as well as positivity and growth (see for example, Booch, 2016). "Society is constantly changing, with each generation believing 'things' are not changing for the better" (McDonald et al., 2013, p. 93). These changes can be described as natural changes, as they occur because of human activity (see for example, Ozmon & Craver, 2003). While some find change scary, or struggle to deal with change, others view it as a necessary part of the progress of humans, and directly caused and created by humans. The world, according to some, changes because humans create change. This can be understood perhaps, by looking at the chronosystem in Bronfenbrenner's ecological theory. The chronosystem describes how human experience changes over time, and how the change in the people also results in effects on the environment and thus more change (see for example, Bronfenbrenner, 1994). Just as the environment affects the individual, the individual can have an effect on the environment (Wong, 2005) which leads to changes within societies.

Technology, particularly digital technology, is one such change. Digital technology has been growing and developing rapidly, and along with it so has the world and the way in which everyday tasks are preformed (Donohue, 2003; McDonald et al., 2013; Yelland, 2007). The generation and growth of new technologies, specifically digital technologies, has reshaped how our lives and our societies operate (Kesi, 2014; Siraj-Blatchford & Siraj-Blatchford, 2006; Yelland, 2007). Digital technologies have not only been developing rapidly in recent years; some believe there will be a continued growth in the future (McPake & Plowman, 2010). Over time the changes that occur affect

the environment and the development of individuals, such as the way the chronosystem is believed to work within an ecological model of development (See Bronfenbrenner, 1994). What is once deemed new becomes the way in which tasks are regularly preformed. What is new to one generation, perhaps the generation that creates the change, is what the next generation experiences as the normal, or regular way of preforming tasks, thus the way societies operate changes over time with these changes to the environmental aspects of life.

If change is continuing to occur in the environment and daily tasks, perhaps people are also changing to suit the rapid changes in the way societies operates and performs daily tasks. Social, economic, and technological changes affect the way the world operates and the experiences people have within the world (Arthur, Beecher, Death, Dockett & Farmer, 2005). Societies and cultures can change depending on the information they have and the interpretations of those. Gibbons (2010) explored the idea that technology is defined by what a particular culture understands technology to be, and the impacts of technology can cause change within cultures. For example, the idea that formal education is of high importance causes the implementation of a cultural rule that formal education is necessary, thus changing how people live and learn. These changes highlight the way in which societies' ideas can influence the lives of the next generation and the accepted ways in which different societies operate. Digital technology is one of society's changes, one that is continuing to evolve and change, and possibly affecting more than just those who use digital technology.

1.5 Digital technology and the future

Preparing young children for the future they face in their education and lives is a difficult task, partly because we cannot foresee the future in general, and partly because the movement of society has been so rapid with the impact of digital technology. As McDonald, Nutkins, and Stephen (2013) pointed out, "at this point in time, we cannot predict which jobs will exist in 10 years' time, mostly as a result of very recent advances in information technology" (p. 137). The Digital Technologies curriculum which has recently been established in New Zealand suggests that emphasis be placed on children learning to be critical thinkers, who address issues as the issues arise (Ministry of Education, 2017a). In this way, children will be learning more about reflection and analysis as a way of approaching tasks, rather than focusing on individual tasks and tools, as those tasks and tools look very different when those who are children now, are adults.

There are many ideas on the skills that will be most valued and relevant in the future – some of them include innovative and creative thinking (Yelland, 2007), having high literacy and numeracy skills along with a positive disposition (McDonald et al., 2013), and having a willingness to

embrace new ideas and adapt to new tools (Estes-Del Re, 2011). "It is apparent that being able to generate, think, inquire, collaborate, critique, and communicate ideas and knowledge is relevant to all disciplines and domains of knowledge. These can be regarded as the new basics of the twenty-first century" (Yelland, 2007, p. 8). These authors agree that today's learners, in preparation for their future, need to learn the skills of critical thinking and reasoning, and being innovative. This idea of children becoming innovative in preparation for their future is not necessarily a new concept. In fact, Locke believed children should not just be given toys, but that they should make the playthings themselves (Garforth, 1969), which is the idea of encouraging the development of innovation in young children. Perhaps the best preparation for young children, is to learn how to use whatever is available to them to reach their objectives (McDonald et al., 2013), including using digital tools alongside other skills and tools (Parette, Quesenberry & Blum, 2009).

Others discuss the importance of looking at what is beneficial for children today, including allowing for hands-on experiences of digital technology as tools for learning if that will benefit their learning in the present (Donohue, 2003). As no one can predict the future, it may be important to look more closely at how to develop adaptability and creativity, along with innovative and critical thinking, in early childhood education. Preston suggested, "educating people to cope with lifelong learning in the electronic age may be the greatest challenge civilisation ever faces" (2001, p. 203). It may be that a knowledge of programming and being able to use digital technology in a way of their choosing will be the best possible knowledge children can hold in the future (21st Century Learning Reference Group, 2014). This is one aspect of specific skills that some are determining to be of importance in the future.

There are other implications for the future that perhaps the children of today will be able to, or need to, address. One idea presented by Gosier (2014) is that a future challenge of digital technology that innovative thinkers may be able to address will be the issue of accessibility, which is an issue of society as well as of digital technology itself. Gosier (2014) suggested that innovative thinkers of the future may be able to find ways to make digital technology and associated tools such as computer programs and applications (apps), available to everyone. As digital technology grows and develops, so too does the chance of every individual to reach his or her true potential and make a difference (Kelly, 2005). One possibility for education is to focus on teaching children to explore who they are and how to look objectively and openly at what is happening in the world and their individual place within it, and such a focus could use the approach offered by existential phenomenology (Ozmon & Craver, 2003). In order to create the best future for themselves and their fellow humans, perhaps one suggestion could be for children to become critical and innovative

thinkers, who reflect on themselves and their role in society, and who have a strong sense of responsibility for their own actions.

In looking towards the future of education within New Zealand, the Ministry of Education created a draft plan in 2015 which tried to create a picture of what education may look like in 2025, with some goals for getting there and maintaining meaningful learning in a 2025 environment. One of the main themes of this 'future of learning' document is the idea that learners in the future will have much more control over what and how they are learning (Ministry of Education, 2015). This document also discussed the idea of children being connected learners, whose educational environment is able to cater to their individual needs, and who can easily access resources for learning from anywhere in the world (Ministry of Education, 2015). The future for learners may require everyone to have basic knowledge of digital technology and an ability to be an active part of peer-to-peer learning relationships (Ministry of Education, 2015). This suggests that part of the future of education is belonging to a wider network of learners, and creating strong communities of learners.

1.6 Knowledge in a digital world

"Human knowledge is a cognitive web spun by our species over thousands of years, and spun internally in part by each of us as we learn and think over our lifetime" (Breck, 2002, p.5). With the introduction and growth of digital technology in society, the way knowledge is constructed and viewed is changing too. Digital technology affects knowledge as well, because knowledge is the way information is understood within society. Knowledge is the way humans grow and learn cognitively within the society they are in (Breck, 2002) and can be explained as a complex building of a variety of types of information along with the understanding and critical reflection of that information (Neuman, 2011). It is something that grows and develops over time and is influenced by past and current societal factors. As Breck (2002) explained, "human knowledge is a cognitive web spun by our species over thousands of years, and spun internally in part by each of us as we learn and think over our lifetime" (p. 5). Knowledge could be described as the information and understandings that are present within societies. As Wong explained, "overarching each society is a dominant culture – the dominant knowledge, beliefs and values of that society" (2005, p. 30). Society and communities are important in the building of knowledge, and as societies change with the increase in digital technology, so too will the knowledge of individuals within the changing society. Technological advancement is rapid and the society and world in which children are growing up in is also changing rapidly, which requires new understandings and knowledge to be sought (Wong, 2005). "In a connected world, no individual person or organisation can stand alone. The success of one depends on others, and the failure of one impacts the other. In such a world,

synergistic benefits of knowledge creation considerably outweigh the accumulated benefits of individual knowledge" (21st Century Learning Reference Group, 2014, p. 37). This means that knowledge is most beneficial when it is created and shared by society as a whole, such as on the internet, rather than being individually constructed. Society can be described as many communities that exist on the planet together. A community can be described as a group of people who often share ideas and knowledge with others within the community, and can be seen as the building blocks of society.

McDonald, Nutkins, and Stephen (2013) described a community as the physical environment available to an individual, including their neighbourhood and immediate social networks. However, when looking at the community and the impact of digital technology on communities, many authors discuss the idea of a global community. Ideas are able to be shared between people in different areas of the world (Allen & Blake, 2010; Danby, 2013; McDonald et al., 2013; Neuman, 2011). Preston (2001) discussed the 'global village culture', which is how digital technologies can be used to contribute to ideas and understandings, while remaining in their own culture physically. This idea was echoed by Donohue (2010) who stated, "the way of the Internet today focuses on collaboration, creates a participatory culture, encourages user contributions, builds collective intelligence, and creates connections leading to community" (p. 85). The online village of multiple villagers adding information from their individual knowledge to a bigger pool of knowledge, was described by Neuman as a "global information village" (2011, p.17) However, the ability to communicate globally is not without its warnings. Gibbons (2010) discussed the idea that different cultures and societies hold different values and beliefs, meaning that the technologies relevant to each may be different, as well as the information deemed important to share, which may also be different. This raises questions around who digital technology is important for and whether there is a 'this is best' ideal when it comes to using digital technology for learning (Gibbons, 2010). Perhaps communicating and learning globally needs to be carefully taken within the context information is given and received, with each individual interpreting the world according to their own unique view, and understanding that the beliefs and understandings expressed by the global community may be specific to one cultural group.

The idea of communities becoming global leads on to the idea that knowledge may also be seen as globally attained. Breck (2002) expressed the idea that knowledge is able to be obtained by anyone, anywhere using the internet. Information, ideas, and knowledge are easy to share and are readily available for those who seek them (Neuman, 2011; 21st Century Learning Reference Group, 2014). Within this era of global learning, each person is becoming more dependent on others for their successful learning and knowledge growth (21st Century Learning Reference Group, 2014).

Knowledge is, however, still built by the individuals who put together the pieces of information they gather, and is affected by how they comprehend that information (Neuman, 2011). Perhaps critical thinking is an important task in creating knowledge, particularly with so much information available so easily.

1.7 Growing up with digital technology

Nikki Kaye, the New Zealand Minister of Education at the time the Digital Technologies curriculum was published, described children as, "'digital natives', born into an age where computers, mobile devices and the internet are so familiar they cannot imagine life without them" (Ministry of Education, 2017a, p.1). Children are seen as relating to digital technology as part of their natural behaviour. "There is little chance of a child born today growing up without interacting with, using and being affected by technology, particularly digital technology" (McDonald et al., 2013, p. 154). Children growing up today are exposed to many types of digital technologies from very early on in their lives (Ficken, 2013; Parette et al., 2009; Yelland, 2007). Adults and older children may use cell phones and online shopping services, they may play games online, and they may even use video conferencing to communicate with loved ones who are geographically distant. As society increasingly integrates digital technology into daily life, children are born into a world where they observe the use of such digital technologies as the socially normal way to operate and interact with the world (Danby, 2013; Hatherly et al., 2009). Bolstad (2004) observed that "information and communication technologies are becoming more embedded and ubiquitous in the environment around children" (p. 7). It seems to be a commonly held view that children in today's world will have some type of exposure to digital technology.

Not only are children being influenced by the experiences they have with digital technology growing up, they are also influenced by the adults and their view of technology. McPake and Plowman (2010) discussed how the experiences adults have had with digital technology can influence their views on it, and in turn, that can influence the way in which digital technologies are portrayed to children. This process is called prolepsis. "Prolepsis refers to the ways in which children's social and cultural development is determined by cultural and historical constraints which pre-date their existence" (McPake & Plowman, 2010, p. 218). This means that if an adult has negative ideas around digital technologies, they are more likely to see digital technology as negative for children, whereas an adult who has a positive view of digital technology will see it as positive for children (McPake & Plowman, 2010). These views that the adults hold may transfer to the children, resulting in the child either viewing digital technology as good and positive for their learning and development, or as bad and negative for their development. The idea that children are learning through what they see within their environment is not a new idea. Both Bandura and

Vygotsky put forward the theories that children learn what they experience within the environments they are a part of, and that new ideas, concepts, and ways of doing things needs to be modelled to young children so they can learn about them (Crain, 2000). This could mean that if the idea that digital technology is bad or scary is modelled to children, they will develop those same ideas and approaches, whereas if digital technology is viewed and modelled in a positive way, children may be more likely to view and use it similarly.

According to McPake and Plowman (2010) the relative newness of digital technologies creates a disconnect between the world adults today grew up in and the world children of today are growing up in, which creates a disturbance of prolepsis and possible negative feelings towards the current childhood experience. This is an important influence on children growing up today. McPake and Plowman (2010) found during their study on the influences of young children's experiences of digital technology, that the views parents have on digital technology have a major impact on the opportunities young children have to explore and experience digital technology. This is in line with Bronfenbrenner's (1994) ecological theory which suggests that the experiences young children have in their immediate environment can have an effect on their development. These influences on a child dictate the experiences they are able to have, which affects the norms they come to believe around society and digital technology. They may not want to learn about digital technology based on what they hear, what they see, and what is available to them because of the views of others within their immediate environments. Alternatively, there may be a huge interest for the young child who experiences environments where others are positive and interested in digital technologies.

While that may be true, McDonald, Nutkins, and Stephen (2013) expressed the idea that even if parents have no interest in digital technology, when able, children will still explore it apart from their parents. This creates the idea that despite parents' views on digital technology, children are still influenced by the prevalence of digital technology within the society they are growing up in. This may be because a person is also influenced by the world they grow up in, and their ideas and perceptions can be created by the society in which they live (Berger, 2001). So there remains a possibility that even if a child's immediate environment does not place value on digital technology, a child may still learn about it and gain positive ideas around it because of the society they are exposed to. They may, of course, also learn a dislike or distrust of digital technology. Children will learn attitudes towards and understandings of digital technology from a range of sources.

1.8 A digital divide?

One of the differences being noted with the increase in digital technology is the gap created by income. One concern is that having limited access to digital technology now could result in further

divides as those with less access now are gaining less knowledge, thus widening the gap (National Association for the Education of Young Children & Fred Rogers Centre, 2012; Yelland, 2007). McPake and Plowman (2010) found during their study that families who were financially struggling found ways to access digital technology, such as through purchasing second-hand products, and actually gave their children more opportunities to use the digital technologies. Children from lower income families may in fact spend more hours with digital technology, but perhaps in different ways, with different types of digital technologies based on the cost of items (Campaign for a Commercial-Free Childhood, Alliance for Childhood, & Teachers Resisting Unhealthy Children's Entertainment, 2012). This suggests that one of the issues with digital technology is equitable access – meaning that all children should have the same ability to access that same equipment, and thus have the means to grow and develop to the best of their abilities.

When looking at the digital divide in low socioeconomic schools, Blackwell, Lauricella and Wartella (2014) suggested that teachers who gave more opportunities for students to use digital technology within the classroom, also expressed a much more positive attitude towards digital technology in the class. Centres can also bridge the gap in access to digital technology by having digital technology available to families and assisting them in gaining skills around digital technology (City of Manukau Education Trust, 2005; Grey, 2011; National Association for the Education of Young Children & Fred Rogers Centre, 2012). Allen and Blake (2010) however, expressed the opposing view that low socioeconomic schools had less funding available, resulting in less access to digital technology in those classes and adding to the digital divide. Gosier (2014) discussed the idea that technology and innovation can be viewed in a similar way to wealth in the way that few people seem to have the full access and benefits, with some smaller amounts seeping out to the many. It would seem that there are opinions on all aspects of the digital divide and what it means for the environment a child is growing up in and their educational experiences.

There also exists a divide in the services available in terms of online capabilities. There are still rural and remote areas of New Zealand where access to the internet is limited or even non-existent (21st Century Learning Reference Group, 2014). The 21st Century Learning Reference Group suggested in 2014 that the wireless internet access (which is the only internet access to some rural and remote areas) is affordable. However, the area this research student lives in is a rural and remote area of Auckland and at the time of this research had access to only wireless internet, which was both unreliable and expensive, and not accessible to all areas of the community. This shows that even in New Zealand, there are inequalities in access to digital technology for a number of reasons. Statistics on the availability are rather limited. The last statistics from Statistics New Zealand (NZ) were collected in 2012 and released in 2013. The statistics available show that "4 out

of 5 New Zealand homes had access to the Internet" (Statistics NZ, 2013), and "two-thirds of rural households had a broadband connection" (Statistics NZ, 2013). Each of those showed growth since the previous census in 2009, but each still showed room for improvement by ensuring more people have access to the internet. It also showed that there is currently no way to know the likelihood of families having adequate access to the internet or to any other digital technology.

Whether the 'divide' looked at is digital or not, there remains inequality within society. Inequality existed prior to digital technology and will continue to exist separate to the issue of a digital divide (Gibbons, 2010). Therefore the digital divide may be more of a societal issue that pre-existed the introduction of digital technology and may or may not be affected by the use of digital technology for furthering knowledge and status. The lack of access to new technologies leads to questions being raised about deeper social aspects, such as the financial position of families in today's societies (Yelland, 2007). Therefore, it is hard to make a judgement on what exactly the digital divide is, or how it affects a child's ability to interact with digital technology more than any disadvantage they would have already faced in society through other aspects of life. McPake and Plowman (2010) suggested there is an influence even greater than financial limits of families in terms of a child's experiences with digital technology. "Our research concluded that parental attitudes towards these technologies are more influential than economic disadvantage in determining young children's experiences" (p. 210). Perhaps there are many influences and each needs to be considered for individual children to gain a holistic view of the individual child's advantages and disadvantages when accessing their experiences with digital technology.

1.9 Conclusion

Digital technology is currently developing rapidly in the world, and much like other technological advances in the world, there is uncertainty created within society around what this means for the world as a whole. With any changes come adjustments, and that is true of digital technology - the advancements have led to adjustments of understandings around what knowledge can mean and how it can be acquired, and even how daily tasks are done. The children of today are looking towards a very rapidly changing future with growth and changes happening quicker than any other time in history. The ability to acquire information has increased and become more instantaneous than ever before, which is requiring a relook at what skills are important. With the new tools and technologies becoming available also comes the question about fairness and ability to access resources within communities. The possibilities for further inequalities exists and must be identified, and rectified where possible. There is no doubt that changes create a need for deeper thought and discussions within communities.

Chapter 2: Digital technology in early childhood education today

2.1 Introduction

Society has changed, with the increased use and implementation of digital technology. This has meant a change in the world children are growing up in. It was suggested by Gibbons (2015) that teachers and students could approach technology as an instigator for deeper thought on learning and teaching, and that technology could encourage further questioning and studying. Just as there are many people involved in the early education of young children, there are many affected by the decisions and processes used within the sector. This was explained well by Donohue, who wrote:

> The question is not *if* we should use technology, but *how* and *why* we use technology to improve program quality, increase responsiveness to parents, and expand opportunities for professional development. When used effectively, technology tools can support and enhance learning, teaching, documentation, program management, customer service, staff and parent communication, marketing, staff development, networking, and advocacy (Donohue, 2003, p. 17).

The questions of how and why are very relevant to this research, which looks at a particular tool associated with digital technology and how and why teachers form certain beliefs, around not only digital technology in general, but around a possible tool. However, it is important to look at digital technology as a whole first, to gain some understanding of where different beliefs may have come from.

This chapter looks at what some of the implications and expectations are around digital technology in early childhood education. This includes what it means for early childhood teachers' practice, the early childhood curriculum of New Zealand, how digital technology relates to other curriculum approaches, and how digital technology can impact on the safety of young children. In this chapter, the links between *Te Whāriki* and digital technology are discussed, with the original 1996 version being referred to first as this was the one that was current when this research began and when the interviews with participants were carried out. This is followed by a reflection on the newer 2017 curriculum. The chapter also looks at aspects of child development and the relationship between that development and digital technology.

2.2 Digital technology and early childhood education in practice

With an increase in possible resources and new digital technologies available, the question arises of where it all fits in terms of the education system relating to early childhood education. One of the instigators of this research project was the question around where digital technology is in centres, as well as why it is not utilised more frequently and in more meaningful ways. "Quite frequently, a visitor in many early childhood settings might think that young children were asked 'to leave their

technology at the door' before entering the classroom" (Parette et al., 2009, p. 336). As described throughout the first chapter, digital technology is evident in most children's daily lives outside the early childhood setting, yet it is not as visible within the early learning settings. Yelland (2007) pointed out, "As societies have evolved to accommodate these massive changes, the worlds education systems seem to have maintained their traditional and national characteristics" (p. 9). Some hold the view that the education system is not keeping up with the world (Winsor and Blake, 2010). This view suggests the education system is not implementing newer resources. The views that educational settings are not moving with the times by incorporating more digital technology implies that digital technology is just left out of education without any thought given. While that may be the case, there may also be a conscious decision to leave digital technology largely out of early education settings. Some believe that delaying the use of digital technology, or being more cautious with its integration into the education system, may offer advantages. Delaying the integration of digital technology in the early childhood education sector may have given more time for pedagogy development, more time to seek and use information from education sectors who began using digital technology earlier, and more time and resources with which to understand the possible implications for teaching and learning using digital technology (Bolstad, 2004). Delaying the use of digital technology in early childhood education could give more time for debates around what exactly the role of digital technologies in the education of young children could be (Miller, 2005). 'Digital technology' is a subject that many authors hold strong opinions about what is right or what is appropriate. While there are suggestions that digital technology is not being utilised enough, there are equally suggestions that digital technology is inappropriate, perhaps even harmful, in an early education settings. Perhaps the main influence of a teacher's view of digital technology being a positive or a negative factor within early childhood education is the teacher's own prior experiences (see for example, Gibbons, 2015).

'Best practice' and 'quality early childhood education' are terms that are often used when discussing different aspects of early childhood education. This is true of digital technology in early childhood education as well. Some authors express the idea that best practice in the integration of digital technology within early childhood education is no different than best practice in any area of the teaching field (McDonald et al., 2013; National Association for the Education of Young Children & Fred Rogers Centre, 2012). However, there are suggestions that the use of digital technologies within early childhood education must be done in a thoughtful and purposeful way with careful assessment relating to why it is being incorporated, so the digital technology contributes to the centres curriculum (Donohue, 2010; Estes-Del Re, 2011; Judge, 2001). Judge (2001) and Allen and Blake (2010) take this idea a little further with the suggestion that digital

activities must also be in line with children's individual learning and development in order for it to be meaningful for children's learning. Similarly Miller stated that "technology education should be guided not by a focus on tools, but rather by activities that help children develop their full capacities" (2005, p. 57). This suggests that the goals for children's learning and development need to be a part of the review of new digital technology, or any new tool or approach, before being implemented in the centre. The toys and equipment that are used with and for the children have an effect on the way in which children play (see for example, Gibbons, 2007) so consideration is needed about why and how, and even if, different aspects of digital technology are used within a centre. There are some authors who believe that digital technology needs to be integrated into the curriculum practices alongside other, more traditional tools, rather than in place of such activities to achieve best practice (e.g. Arthur et al., 2005; Bolstad, 2004; Breck, 2002; Danby, 2013; Donohue, 2010a; Judge, 2001; McDowall, Davey, Hatherly & Ham, n.d.; Nemeth & Simon, 2012). Breck (2002) expressed the idea that digital tools need to be considered for the learning opportunities, rather than to merely have the machines present. These authors have all suggested a similar idea, which is that the intention behind incorporating digital technology is more important than what is actually used. Siraj-Blatchford & Siraj-Blatchford (2006) further explained, "too often ICT has been seen as something just to be bolted onto existing educational practices, rather than to transform them" (p. 39). This idea was also illustrated in a study conducted by Grant and Mims in 2010, which found a lack of balance between digital technologies and other activities within the early childhood centre, and that where digital technologies were being used it was not in any meaningful way for the children. The question of how to do this remains. After all, best practice can mean different things, depending on the views and beliefs of the educator (Gibbons, 2010). In New Zealand, the Ministry of Education created a Digital Technologies Curriculum in 2017 to assist teachers, families, and students are being supported in their use of digital technology and to ensure it is used for its merits, and not simply as an addition to the existing curriculum. The Digital Technologies curriculum not only provides information, but also guidance as to how to implement the use of digital technology within educational settings.

The underlying view of this research is that the teachers are the implementers and key players in the integration of digital technology. This is an approach that has also been suggested by others, with the idea being that for the use of digital technology to be properly integrated into early childhood education, the practitioners themselves need to review their own practice and be reflective in the way they approach their teaching and the use, or lack of use, of digital technology (Gibbons, 2010; Preston, 2001). Some authors have pointed to the view educators hold, that digital technology use is one of the most important lessons a young child can have in terms of learning about the technology,

as it will result in the child viewing digital technology in either a positive or negative light, depending on how the important adults in their lives respond to it (Simon &Nemeth, 2012; Siraj-Blatchford & Siraj-Blatchford, 2006). One interesting idea is the need for early childhood settings to reflect the world that children are growing up in (Estes-Del Re, 2011; Yelland, 2007). As Yelland discussed, "the relevance of school will be continually brought into question by students whose daily lives are growing increasingly different from what they are experiencing in their classrooms" (2007, p. 9). Perhaps what is needed is for educators "to examine what a familiar context means for children today and question whether we are supporting children in a context which is 'comfortable' for us rather than familiar to them" (Tyler, 2010, p. 39). One way to ensure relevance of practice may be for teachers to have in-depth reflections of not only their own beliefs and practices, but also those that are held collectively within the centres where they are working. These reflections need to look at how practice is reflecting the real world of the children and the community, as well as what values and approaches the centre has as part of its philosophy.

Part of this discussion needs to look at what the world of the child looks like and how education settings are making links between a child's home life and centre life, and a child's family plays a part in this. Often children live in a world surrounded by digital technology (see for example, Bolstad, 2004; Estes-Del Re, 2011; Kesi, 2014). Children's lives outside of a centre may have many aspects of digital technology involved, depending on what the child's family believes about digital technology and its impact on children. The beliefs a family has, and its goals for its child, impact on other people in that child's life, including the child's teachers (Winsor & Blake, 2010). Another aspect of this is that the beliefs and ideals of parents and families can put pressure on a teacher to incorporate digital technology into the classroom (Miller, 2005). However, a positive aspect of digital technology can be the increased ability to communicate between families and teachers (McMurtry & Burkett, 2010; Morris et al., 2010; Tyler, 2010). With the use of the internet, teachers and early learning centres can share photos and stories of children's learning more easily, as well as using email for sharing information and passing on notices (Morris et al., 2010). Communication between families and early learning centres has become easier and quicker. Communication has also become more shared, with families equally having easier communication with teachers and educational settings, leading to more collaborative partnerships, with families, children, centres, and even communities being able to work together more easily (Arthur et al., 2005). What is clear, is that communication is important – communication around what a family believes about digital technology and how that fits with a centre's views, as well as the potential for communication and consultation with families using digital technology .

With advances in digital technology and tools happening so rapidly, it can be impossible to keep up with the latest gadgets and tools within education. Some suggest that rather than looking at individual tools associated with digital technology, a more important focus should be the processes involved with creative and innovative thinking (Ministry of Education, 2015; Woodgate, 2018; Yelland, 2007). Holdom puts forward a similar idea when she states, "dispositions, rather than skills, are what tamariki need to succeed in the future" (2018, p. 9). The Ministry of Education (2017a) identified the traits of creative innovative thinking as integral to effective practice when incorporating digital technology. Some of the goals for children that are suggested in the Digital Technologies curriculum are that they are able to reflect, investigate, justify, and critically analyse (Ministry of Education, 2017a). Within the education system, curriculum and policies should, in the views of Siraj-Blatchford and Siraj-Blatchford (2006), allow children to learn skills that help them use digital technologies to seek knowledge, create new knowledge, and practise skills of reasoning and understanding. The 21st Century Learning Reference Group suggested in 2014 that some of the changes needed in early childhood education settings need to have more targeted funding available to teachers and centres for professional development and resources, increased research on a national level to provide further information, nationwide policies to help guide teachers and early childhood education settings, and legal ways for teachers and students to share their resources and ideas. In the view of the 21st Century Learning Reference Group (2014) more researched information, easier access to appropriate resources and guidance, and increased leadership will help to keep education systems relevant to the children, communities, and learning goals of individuals.

With the understanding that change needed to happen to reflect the changing societies, and digital technology needed to be more formally addressed within the education sector, a new curriculum document has recently been released in New Zealand. The Ministry of Education curriculum document notes that "children and young people often arrive at school knowing how to use digital technologies – but learners also need to be able to understand and create digital technologies to succeed in further education and the world of work" (2017a, p.5). This document not only defines what is currently understood by the early childhood education sector about digital technology and education, but also addresses the need to prepare students for a future which is uncertain, and points towards skills such as creativity and critical thinking as key goals for students, along with more in-depth knowledge about how digital technology works and how to create and operate different aspects of digital technology (Ministry of Education, 2017a). These themes have been found in the writings of other educational experts, as discussed already. Another theme that has been expressed in the literature (e.g. Parette et al., 2009) is the suggestion that teachers are unsure of how to integrate digital technologies into their teaching in meaningful ways. That concern is addressed in

the Digital Technologies document through the inclusion of some practical exemplars. The new Digital Learning document is focused on the school curriculum from year 1 through to year 13. This means that there are no specifics for early childhood educators or early learning settings. This document will still be useful for the early childhood sector in that many of the same themes are relevant and it is still informative. The Digital Technologies curriculum can still guide teachers in their reflections around digital technology within early childhood settings.

2.3 Linking learning environments

Children learn from all the environments they are a part of. It is highly important that their learning in different environments is linked with their learning in other environments. The New Zealand Early Childhood Curriculum, *Te Whāriki* was strongly influenced by an ecological model of a child and early childhood education. Within an ecological model, development is said to happen through interactions with the same people, environments, items, and processes, which is called the proximal process (Bronfenbrenner, 1994). This suggests that children benefit from having similar equipment and processes available to them in different setting, as well as shared goals and expectations across different environments. *Te Whāriki* states "links between home and early childhood education programmes are important" (Ministry of Education, 1996, p. 18). Bolstad (2004) pointed out that "it is often argued in the literature that children's early childhood experiences should reflect and connect with their experiences in the wider world" (p. 2). Hedges (2014) put forward the idea that knowledge children gain in the wider world of their homes and communities can be added to, edited, and reinforced within an early childhood centre, by the activities they are involved in. Hedges (2014) called this 'working theories', as children's learning is constantly being constructed, edited, and reinforced by the activities and experiences they are involved in within all areas of their life. Hedges (2014) explained that working theories are the ways children think and interpret information to build knowledge. This idea of linking learning environments is also known in an ecological theory view as the mesosystems, and is seen as the way in which the interactions between different environments a child is a part of, affects their growth and development (Bronfenbrenner, 1994). Strong links between an early childhood centre and a child's home life could assist children in their growth and development, and that could include links to how digital technology is viewed and used.

For teachers and their teaching practice, the Education Council of New Zealand (2017a) asked teachers to ensure children's diverse backgrounds are valued. The diverse backgrounds may include respecting the family and communities views around digital technologies. This does not mean having to incorporate every aspect of digital technology in practice, but may include aspects such as discussions with children about how different tasks are performed at home. Winsor and Blake

(2010) also believed that it is important for teachers to allow children the time and resources to build on experiences they have had outside of the early childhood settings, with support from teachers to connect the learning and understandings. This is again highlighting that teachers need to be thoughtful and reflective in their practice. They need to look at how and why they are allowing links to be created between environments and how they support the children in creating links between learning environments and learning experiences. Bolstad (2004) suggested that due to the affects of digital technology on the rest of a child's daily life, digital technology is a relevant topic in early childhood education. As children are learning about digital technology at home, the ways in which early childhood centres use digital technology could be either supportive or conflicting with what a child already knows (Winsor & Blake, 2010). This could be true of any activity or resource and means that teachers of young children need to be aware of the role digital technology plays in young children's lives and reflect on how that is valued within the centre, even if that means being aware of how children are responded to when they talk about a new video game they have at home (for example). For some children, digital technology is a common part of their daily lives, and for others it is not (Danby, 2013). Including children's learning from their home lives of digital technologies and the uses of such technologies can be positive learning for the entire classroom (Danby, 2013). If there is a digital divide, perhaps children can share their knowledge with each other to help bridge such a divide. If there is another reason why children have not used digital technology, teachers need to be aware of that and reflect on how the families' values are being upheld and respected.

2.4 Te Whāriki and digital technology

In New Zealand in 1996, the Ministry of Education released the first curriculum document for New Zealand early childhood education settings. This document, named *Te Whāriki: He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa, Early Childhood Curriculum*, was intended to provide "the basis for consistent high quality curriculum delivery in the diverse range of early childhood services in New Zealand" (Perris, (1996), in Ministry of Education, 1996, p. 7). Therefore, this early childhood curriculum can be seen as setting the standard for curriculum aspects of early childhood setting within a New Zealand context. So how did it relate to digital technology?

In terms of direct links to digital technology, there are very few within the 1996 *Te Whāriki* document. *Te Whāriki* is a curriculum that allows for flexible interpretation in order to incorporate many different approaches and as such it does not specify how the goals and learning outcomes it sets out are met; there is no one way, or right way, or particular approach, that is seen as the only way. It is open to thoughtful and meaningful interpretation. Throughout *Te Whāriki*, there are references to young children having the opportunities to use various technologies. While computers

are mentioned only a very few times, broad references to 'technologies' could easily be interpreted as all technology relevant to the current world, including digital technologies.

One aspect of the 1996 *Te Whāriki* document and its relationship to digital technology, is the aspect of prior knowledge and the links created between a young child's various environments. One of the foundations of *Te Whāriki* is the principle of empowerment. A part of empowering children is to build "on the child's own experiences, knowledge, skills, attitudes, needs, interests, and views of the world within each particular setting" (Ministry of Education, 1996, p. 40). In other words, any technologies, digital or otherwise, that children are familiar with outside of the centre environment are relevant and important to their learning, including within the centre, as this is the world in which they learn and grow and become an active part of. This idea that childrens' learning and knowledge outside a centre is important and relevant to their life in the centre, is reinforced in the *Te Whāriki* principle of family and community. This principle states that, "the curriculum builds on what children bring to it and makes links with the everyday activities and special events of families, whanau, local communities, and cultures" (Ministry of Education, 1996, p. 42). As technology, including digital technology, is an integral part of the world a child is growing up in, what is relevant may not be the same for every child. If video conferencing is a regular part of family life for a child, that will be a part of what that child knows and is learning about in the world. This does not mean the centre needs to use video conferencing, but that it needs to respect the ways a family uses the technology. A child growing up using video conferencing, for example, will be learning about the capabilities of digital video cameras and the limitations of some sensory experiences when communicating via video conferencing. A young child familiar with video conferencing may be learning about the need to move in certain ways when communicating via video conferencing, as well as learning specific terms and ways of talking about the particular digital technologies associated with it. This is reinforced in the strand of belonging, where *Te Whāriki* discusses children developing "awareness of connections between events and experiences within and beyond the early childhood education setting" (Ministry of Education, 1996, p. 56). This again suggests that the learning children are experiencing both inside and outside of their centre is important, and the links needs to be acknowledged and fostered in every way possible in order to allow children's' knowledge and learning to grow and develop.

While *Te Whāriki* does not specifically discuss digital technologies, it does discuss the need for equipment to be provided for "scientific, mathematical, and technological learning" (Ministry of Education, 1996, p. 83). This is stated within the strand of 'exploration', which expresses the need for children to explore the world with as many tools and opportunities as possible (See Ministry of Education, 1996). For some teachers, children, and families, digital tools can be a part of the

environments in which they are involved, and can therefore be relevant tools to use for young children learning about the world. This can make the tools and processes involved with video conferencing a more natural and relevant way to explore the wider world. For those who are not experienced with the digital technologies involved with video conferencing, using it in an early childhood setting can provide many new learning opportunities, starting with learning about the tools and processes themselves, and leading to interactions not otherwise possible.

Te Whāriki holds that links with the wider world are valuable and important for young children. The strand of 'belonging' asks that early childhood education settings and teachers ensure there are links with communities and the wider world (Ministry of Education, 1996). This is one area where video conferencing could provide some value to the children and early learning settings. With video conferencing, there can be an increased ability to communicate with a wider range of people within a community. Children and their teachers can have the possibilities of talking to various other community members from their local area, their country, and even internationally. The need to travel to communicate or visit others is decreased and the ability to communicate in real time is increased for many early childhood settings. This can offer many possibilities for children, including a sense of pride in where they belong – their centre and immediate community – as they share with others information about their environments.

'Communication' is one of the strands of the *Te Whāriki* early childhood curriculum. This strand looks at goals for all types of communication, verbal as well as non-verbal (Ministry of Education, 1996). With video conferencing, children can have access to an added tool to assist in developing the skills of listening and responding to others. It can also provide opportunities to learn to communicate verbally in different ways, such as asking deeper questions, asking follow-up questions, and even speaking to others who may have a different first language, which can mean working with different accents or different ways of wording ideas and concepts. Using video means that alongside verbal communication with a person in a different location, some non-verbal communication cues will be noticed as well, through facial expressions and some body movements.

The early childhood curriculum of New Zealand remained the same for twenty years. As with everything in the world, it is helpful for curricula to change to suit the current society to which the teachers and learners belong, as well as to incorporate new knowledge and understandings. It is beneficial to look at a more current view of the future of the learners and ensure the curriculum is guiding towards a learning environment which continues to allow learners to grow and develop to the best of their potential within the structures of the society and world they are living in, and will contribute to. In fact, the 1996 *Te Whāriki* document itself discussed changes to the world being

rapid and a need for early childhood education to provide "an educational foundation that supports the full range of skills that children will need as life-long learners" (Ministry of Education, 1996, p. 18). In order to remain current, in 2017 the Ministry of Education released a new and updated curriculum document for early childhood education within New Zealand.

There were few changes evident when comparing the content of the two versions of *Te Whāriki*. There were still few specific mentions of digital technology in the new *Te Whāriki* document. However, as with the original *Te Whāriki*, the goals were broad and set in a way that can incorporate many different approaches and tools for learning.

The strand of 'contribution' makes reference to digital technology. It states that, "children's contributions to their wider communities may occur through direct participation or virtually, through the use of digital and other technologies" (Ministry of Education, 2017a, p. 36). This suggests ways of digital technologies being utilised as relevant and valuable ways for children to learn and share information. It also recognises that communication and being part of a wider community and society can be done in a range of ways, including through the use of digital technology, which may even encourage teachers to consider new ways to build connections between the centre environment and the wider world.

Digital technologies are also mentioned within the strand of 'communication', in which *Te Whāriki* suggests ways in which children can express their ideas, one of which is through "digital devices" (Ministry of Education, 2017a, p. 44). This is a good illustration of the idea that digital technology is part of a wide variety of tools that can, and perhaps should, be available to children. *Te Whāriki* also asserts, "*kaiako* (early childhood teachers) support children to develop an understanding of security and safety when communicating in a digital world" (Ministry of Education, 2017a, p. 45). This statement suggests to those involved in early childhood education that the learning and teaching about safety using digital devices is a part of incorporating digital technology in the centre. Digital devices being mentioned as a way for children to communicate, and teachers being asked to support children in developing safe practices when using such tools to communicate, could lead to the understanding that digital technology is a valid means of communication within the world children are a part of and should be incorporated into the early childhood education setting. Video conferencing is a great example of a digital communication tool. It provides a way for children to learn about the digital tools associated with video conferencing, as well as ways to learn about safety in communicating, using this type of digital technology.

One of the biggest changes is the terminology used within the *Te Whāriki* document. As an example of children's learning within the strand of 'belonging', the Ministry of Education stated that a strong sense of belonging is, "an ability to connect their learning in the ECE (Early Childhood Education) setting with experiences at home and in familiar cultural communities and a sense of themselves as global citizens" (2017a, p. 32). This is using wording more relevant to current concepts, which are that children are growing up as global citizens with an increasing ability to be a part of the global world and to learn and interact within a much wider society. This statement could also be interpreted as children having the ways and means to interact and communicate on a much more global and diverse scale, with location no longer being a relevant factor for many.

Te Whāriki makes it very clear that a part of the role of *kaiako* in a New Zealand setting is to reflect on their own teaching practice and continually develop as professionals (See Ministry of Education, 2017a). The changes within society should be reflected on, as teachers look at how their practice relates to the growth and development of the children they are involved with. Teachers are role models for the children they are teaching (Ministry of Education, 2017a), and as such, have the ability to role model safe and proper use of tools available to extend on learning and knowledge, including digital tools and technologies. This provides a great opportunity for teachers to model the concept of not knowing being acceptable, and learning being an exciting challenge with difficulties and triumphs, as teachers will not always know exactly how to use digital tools or how to fix possible issues that arise.

There are many ways video conferencing can be used as a tool to enhance the early childhood curriculum and provide for additional learning opportunities for children. Ultimately the exact delivery of the curriculum is up to the individual and teachers involved, but there is certainly scope for video conferencing to be a part of the repertoire of tools used within a setting.

2.5 Digital technology and other curriculum approaches

In Australia, a curriculum document named *Belonging, Being and Becoming: The Early Years Learning Framework for Australia* was created in 2009 for all early learning centres in Australia. This curriculum discusses the idea of children being part of a wider community and the importance of recognising and valuing the knowledge and skills children bring with them into an early learning setting (See Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009). Within this curriculum document there are direct references to the concept of digital technology being used in early learning centres. In fact, the Australian curriculum document, as part of the outcome for children becoming effective communicators, one goal states, "children use information and communication technologies to

access information, investigate ideas and represent their thinking" (See Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009, p. 44). From this goal are written examples of how educators can identify this is happening and how educators can encourage this learning to occur. Part of a teacher's role for this goal is to "provide children with access to a range of technologies" (Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009, p. 44). This curriculum recognises and places importance on the place of digital technology as part of the world children are growing up in and as a relevant learning tool for children in today's world. This curriculum also discusses children's learning, and that they are part of a bigger community and that there are different ways to live within the world (See Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments, 2009). This type of information can be learnt through books and face-to-face interactions in a community, as well as through the internet. "Belonging, Being and Becoming: The Early Years Learning Framework for Australia" recognises that digital technologies and digital tools are a part of the world for many children today and can offer positive opportunities for learning.

The Reggio Emilia approach is based on the philosophy of Loris Malaguzzi, and was established in the Italian city of Reggio Emilia (Arthur et al., 2005). This approach views children as active in their learning and encourages children to explore ideas and concepts using many different mediums to build knowledge in different ways (Arthur et al, 2005). Reggio Emilia is a curriculum approach which has not been widely linked to digital technology in early learning, with more emphasis being given to its views on how children are active participants in their learning and how to extend on their learning through setting up the environment in ways that encourage children to use many mediums to explore ideas. However, Mitchell (2007) asserts that it is used in many different ways in Reggio Emilia and Reggio Emilia-inspired centres. It is used by teachers to document teaching and learning, and to communicate with families, the community, as well as with other centres and professionals to build professional networks and share the Reggio Emilia philosophy (Mitchell, 2007). Digital technology is used by children in Reggio Emilia-inspired centres in the form of assistive technology, as well as being a tool to document learning, assist in creating projects, further knowledge and questioning, encourage exploration, and revisit learning (Mitchell, 2007). Reggio Emilia-inspired centres hold the understanding that digital technologies and digital tools can be used alongside other tools to enhance learning opportunities, as well as believing that children and teachers can learn about digital technologies and their potentials together (Mitchell, 2007). Mitchell explains that Reggio Emilia-inspired centres believe that "young children can be successful learners

if allowed the means to play, interact, and explore in meaningful ways. Technology can play an important part in providing these learning opportunities for all children" (2007, p. 37).

An inquiry-based curriculum is one in which children's questioning and wondering fuels the curriculum delivery (Wang, Kinzie, McGuire & Pan, 2009). In an inquiry-based curriculum, digital technology may assist learning by providing tools which allow further methods of information discovery and learning motivation (Wang et al., 2009). When digital technology is used in an inquiry-based learning environment it can provide opportunities for more experienced children to assist their peers with their learning, model ideas and concepts to children, provide information that may not have been possible to access otherwise, and encourage further research on particular topics (Wang et al., 2009). However, Wang, Kinzie, McGuire and Pan (2009) warn that digital technology may be unhelpful in an inquiry-based learning environment as it could merely reinforce what a child already knows rather than adding knowledge, and may provide too many resources and information, making it difficult for children to take it all in or learn from it. It is the role of teachers in an inquiry-based setting to support children's learning with digital technology and to have digital technology and tools integrated into the setting in a way that allows for positive learning opportunities to occur (Wang et al., 2009).

2.6 Digital technology and diversity

Digital technologies and tools cover a multitude of uses in everyday life. Some of those uses are bridging gaps for those who may otherwise struggle with various aspects of life, including education. Children with disabilities may be able to reach their goals with assistance from digital technology and computers (Judge, 2001). Different tools may help children with gross motor limitations, fine motor difficulties, visual or hearing impairments, or social difficulties (Crow, 2010). Digital technology can even help those with English as a second language, participate more fully in the educational environment and learn English words and phrases (Bolstad, 2004). Crow (2010) pointed out that "assistive tools and services for technology are diverse, as are the children for whom they are intended" (p. 122). However, children using assistive technology still need to be supported appropriately by their teacher/s to gain any benefit from the assistive technology (Crow, 2010). This reinforces the idea that the digital technologies associated with and used for assisting those with additional needs are merely tools, and that the teachers play a vital role.

In order to support children using assistive technology to maximise their learning, teachers need to understand what the purpose and benefits are of the assistive technology (Allen & Blake, 2010). The start of this process is to assess the individual child and decide what assistive technology is appropriate for that child (Crow, 2010). This is not unlike implementing any new practice in a

centre – there needs to be intentional decision making. Crow (2010) also suggested that family be invited to participate in the discussions around appropriate assistive technologies for individual children as it will affect them as well.

Assistive technology, including computers, can have a huge impact on children's ability to participate in their learning environment, with children able to participate in ways they may not ever have been able to otherwise (Crow, 2010; National Association for the Education of Young Children & Fred Rogers Centre, 2012). With increased participation, children with diverse needs may experience an increase in motivation, as well as a greater sense of accomplishment, belonging, and contribution (Crow, 2010). Therefore, assistive technology may be beneficial to children's overall well-being, not just their educational achievements.

2.7 Digital technology and young children's development

How children learn about and with digital technology may depend on the centre and the individual families. However, one way for children to learn is through playful explorations. "Play is a fundamental component of early learning and the all-round development of the child in the formative years" (Yelland, 2007, p. 50). The value of play is a concept that Locke discussed as a method for teaching children, and was recognised as important long before that by Plato (Garforth, 1969). Learning naturally, through playing with real world resources, is how early childhood education in New Zealand is approached, and this allows for many aspects of digital technology to be woven into children's learning and development, alongside other areas of learning (Holdom, 2018). With open-ended digital resources, children can make choices for themselves, which allows more opportunities for exploration and meaningful learning (Judge, 2001), not unlike the ways more traditional tools assist in children's learning.

One factor that needs to be taken into consideration is the possible negative effects of digital technology on the development of young children. Concerns have been raised by various organisations around the use of screen time and the possible negative effects on the health and development of young children (see for example, Campaign for a Commercial-Free Childhood et al., 2012; National Association for the Education of Young Children & Fred Rogers Centre, 2012). "Some critics have argued that computer use is, at best, lacking in educational benefit for young children, and at worst, harmful to children's learning, health, or development" (Bolstad, 2004, p.20). Some suggest limiting screen time for children under five years of age, and having no screen time at all for children under the age of two years (National Association for the Education of Young Children & Fred Rogers Centre, 2012). With these types of concerns being raised, it is important for centres and families to gather information and have informed discussions around what they agree is

best for the children within the particular centre. One important aspect when looking at the effects of digital technology, is to realise that not all digital technology is the same, and therefore, not all digital technology will have the same negative or positive influence on children's health and development (Campaign for a Commercial-Free Childhood et al., 2012). The amount of time children spend with screens may be a contributor to negative effects being caused, with increased screen time possibly contributing to a range of health concerns for children, including disruptions to sleep, problems with social behaviour, and childhood obesity (Campaign for a Commercial-Free Childhood et al, 2012). These are all very serious concerns that need to be taken into consideration. It will ultimately be up to centres and families to decide what is important in their early childhood education setting and why what they decide is important to them.

One possible concern around digital technology that teachers need to be aware of, is the gender differences that children may be presented with. For example, some digital technologies, including video games, may be aimed at, or viewed as being more appropriate for, boys rather than girls (McPake & Plowman, 2010). McDonald, Nutkins, and Stephen (2013) suggested that the way boys and girls use digital technology could be the real digital divide. Some understand the research to be pointing towards girls being more focused on the social aspect of digital technology, while boys are more interested in computer games (McDonald et al., 2013). Perhaps the differences noted in the use of digital technology are being influenced by the views others hold on them, or by advertising. Either way, it is something teachers need to be aware of as affecting the development of children's identities as users of digital technology.

One of the topics often discussed by families and educators is the effects of digital technology on young children's social development. There are arguments that lead one to believe digital technology will have a detrimental effect on young children's social development, and arguments that lead to the opposite conclusions. One study showed that social aspects such as listening, sharing, peer learning, and talking were increased when digital technology was available in a classroom (See Estes-Del Re, 2011). During her literature review study in 2004, Bolstad found that some authors believe children are still able to engage in social interactions involving collaboration and cooperation, and have generally positive social interactions while using computers. Danby proposed that some digital technologies can allow for different types of social interactions and lead to extended ways in which children can think about their lives and the wider communities they are a part of (Danby, 2013). There are concerns that some users of digital technology, or the amount of time spent with screens, could lead to a lack of social skills developing, or even negative social skills developing (see for example, Campaign for a Commercial-Free Childhood et al., 2012). It may be beneficial for teachers to look at different types of digital technology separately, and to

discuss decisions or ideas with families. There are clear and relevant opinions on both sides of the debate and all need to be taken into consideration.

There have been concerns raised about the effects of digital technology, particularly screen time, and the development of language. Some hold the view that digital technology has a negative effect on language development (see for example, Campaign for a Commercial-Free Childhood et al., 2012). There are also suggestions that digital technology could have a positive effect on language development. Where computers are present in a classroom, there may be an increased presence of written language (Bolstad, 2004) as well as increased opportunities to produce work containing written language (Bolstad, 2004). Children may be more able to re-visit their learning experiences, which will allow for greater use of written and verbal language (Yelland, 2007). This will depend on the type of digital technology being used, how it is being used, and the values and beliefs held by the teachers and families involved.

2.8 Cyber safety

As with any aspect of an educational environment, safety concerns surrounding digital technology need to be addressed. One safety concern that is being discussed more and more is cyber safety. Questions arise such as what issues could arise while using the internet, and how can young children be kept safe from those risks.

Some of the known risks of the internet are in the content available and its accessibility to children, the advertising targeting young children, the possibility of inappropriate people having access to young children, and the risk of bullying behaviour (Grey, 2011). It is the opinion of Grey that children are very trusting of computers and oblivious to the possible risks involved (2011). Grey, also asserted that " cyber risks should not be considered a reason to deny children access to ICT, but as an opportunity to inform children about cyber safety strategies to increase their self-efficacy in ICT, so preparing them for a safer childhood" (2011, p. 77). There are tools available to allow adults to have close control over when and what children are able to access on the internet (Wang et al., 2009). In New Zealand there are resources available for educators, parents, and children from different organisations which are easily accessed. While there are risks, there are also ways to minimise and monitor the risks and allow children to explore in ways that also keep them safe. The same can be said about climbing trees where there is a risk of harm, but there are also ways to minimise the risk and review as needed. It is up to the educators and families to decide if the learning opportunities outweigh the risks or not.

There may be cause for rules, policies, and procedures that suit a centre, and families need to put these in place to ensure children are kept safe while still being allowed to access the internet (Grey, 2011). Children need to be involved in conversations about the risks and ways that they can help to keep themselves safe (Grey, 2011). One way to do this is through teachers being involved with the children when they are using the internet. Grey established her view that, "cybersafety requires teachers to actively participate when children are using ICT technology" (2011, p.79). It is part of a teacher's role to be active in the integration and use of digital technology within their classroom and to ensure children are using digital technologies in safe and beneficial ways (21st Century Reference Group, 2014). Teachers and the way they use digital technology can minimise the risks and ensure safe cyber practices.

2.9 Teachers and digital technology

Teachers are tasked with ensuring children are learning skills to allow optimal growth and development as learners within the world. It is an important role with many complexities, including issues surrounding digital technologies and how, or if, to include such technologies within the early childhood education setting. Teachers' attitudes towards digital technology are seen by some as the biggest factor to influence the way young children learn about digital technologies (see for example, Blackwell, Lauricella & Wartella, 2014). Some of those attitudes may relate to fear of digital technology itself, and frustration with other teachers creating obstacles in implementing digital technology (Damoory, 2015). This idea was discussed in chapter 1, section 7 where the idea of prolepsis was discussed, describing how children may learn attitudes and understandings about topics through observing the attitudes and beliefs of the adults around them. As children's learning and development can be influenced by all environments they are a part of (see Arthur et al., 2005), the attitudes and beliefs of teachers may have an impact on the attitudes children develop towards digital technology.

Along with teachers' personal views and attitudes towards digital technology being important, how they integrate it into their teaching practice can also be an important factor. Teachers need to ensure the potential of both the child and the digital technology used is realised (Dawes, 2001). "Teacher proficiency in technology integration is a critical determinant of the educational benefits children gain from using computers" (Chen & Chang, 2006, p. 178). Bolstad (2004) noted a recurrent theme in the literature, that teachers struggle to understand how to implement the use of digital technology in their daily teaching practice. There have been various studies conducted on teachers' use of digital technology in their classrooms. Blackwell, Lauricella & Wartella (2014) explored factors influencing early childhood teachers' use of digital technology and found that teachers who have more teaching experience are more likely to use digital technology in the classroom, but those

teachers had a more negative view of digital technology in education, though the study did not explore why. In 2006, Chen and Chang found in their study of teachers' skills, attitudes and practices using digital technology in early childhood settings, that teachers with more specialised training had a greater likelihood of integrating computers into their classroom. Chen and Chang (2006) also found that almost half of the teachers they surveyed felt comfortable using computers and the internet in the classroom, while half of the teachers expressed that they felt comfortable teaching young children how to use computers. Teachers' attitudes and views seem to be influential in the way that they use, or do not use, digital technology in their early childhood teaching practice. It may be that more training and understanding of digital technology can assist in more positive integration into the early learning centre environments.

Appropriate and meaningful ways to integrate and use digital technology may be some of the issues faced by teachers who choose to use it within their centres. As Donohue (2003) expressed, "the uses of digital technologies and the Internet in the classroom are as open-ended as the imagination and creativity of the teacher" (p. 19). Some authors have found that the digital technology experience in classrooms often amounts to children taking turns using a class computer (see for example, Estes-Del Re, 2011), and teachers using digital technology for administrative purposes (for example, Kesi, 2014). These types of findings would seem to solidify assumptions made that the current use of digital technology in early childhood setting is very limited, and that very minimal digital tools are used (McDonald et al., 2013). Indeed, even some research is limited in its view of the usefulness of digital technology, with the focus of literacy in relation to digital technology being equated to reading and text tasks (McDowall et al., n.d.) with little attention given to any other possibilities for digital technology. This may be contributing to the lack of positive implementation of digital technology in early childhood education settings. Clear policies have been seen to result in more positive teaching and learning while integrating digital technology into the curriculum (see for example, Blackwell et al., 2014).

Early childhood educators are responsible for delivering the curriculum in a meaningful way to the children who attend their service. An early childhood teacher is a motivator and stimulator of the exploratory learning of young children (Tyler, 2010). Part of the teachers' role in terms of digital technology in education is to select and evaluate digital tools and techniques for their appropriateness for the children and the curriculum (Allen & Blake, 2010; Bolstad, 2004; Judge, 2001). Dawes (2001) put forward the opinion that "teachers are responsible for translating into practice the high expectations and the visions of technology enthusiasts" (p. 61). This suggests a lot of pressure on early childhood teachers to be implementing changes to curriculum delivery in order to incorporate more and more digital technology as it advances in society. At the same time, there

are concerns raised about the possible negative implications around digital technology, particularly screen time, in children under the age of five (see for example, Campaign for a Commercial-Free Childhood et al., 2012). There is some concern that teachers are being expected to lead this change while they are being judged as unable or unwilling to make those changes (Preston, 2001). Gibbons (2008) expressed a similar concern that teachers are told they have a critical role, while at the same time being told that they do not have the skills needed to make the necessary decisions. Teachers are tasked with trying to balance out the possible positive and the possible negative effects of digital technology in early childhood education (National Association for the Education of Young Children & Fred Rogers Centre, 2012), as well as work out how to create meaningful, relevant learning experiences and links between a child's home and centre environments. Perhaps one of the keys to ensuring teachers are not only certain in their decisions, but making those decisions for sound reason, is through self-reflection. The Education Council of New Zealand: Matatū Aotearoa sets out expectations that teachers reflect on their practice critically, using a range of different sources to inform those reflections (2017a). In reflecting on digital technology, early childhood teachers need to look at both its positive and negative aspects and make decisions based on information gathered, their centre's philosophy, expectations of their communities, and their own personal views. Decisions around why, or why not, and how digital technology is used within individual centres would then be based on clear and thorough reflective practice.

As with any aspect of teaching, barriers exist in the use of digital technology in early childhood education. It is important to address and discuss the barriers that exist. As Dawes (2001) pointed out, "identification of barriers is one of the first steps towards removing them" (p. 66). Some barriers are to do with the equipment, such as cost of equipment (Dawes, 2001; Donohue, 2010a), lack of support (Dawes, 2001), unreliable equipment (Dawes, 2001), lack of access to internet services (Donohue, 2010a), and lack of ability to express some cultural and language information using digital technology (Kesi, 2014). Other barriers are found more in human behaviour and understandings. One barrier that some teachers may face is a lack of awareness of what the purpose or potential of using digital technology within the curriculum could be (Dawes, 2001). There may be barriers created by teachers lacking an understanding of how to teach children how to use digital technology (Dawes, 2001). Breck (2002) suggested that the barriers are set even deeper for some teachers as some have a genuine fear of machines and of new digital technologies. The type of professional development provided for teachers around the use of digital technology is seen by many as a barrier that exists for today's teachers (Gibbons, 2010). McMurtry and Burkett (2010) expressed the view that any barrier or challenge must be overcome by the teachers themselves so that they may provide the best possible education for young children.

While it may be easily commented that teachers must find a way through the barriers and reach a stable merging of current curriculum and new practices, the education and support of teachers to do so needs to be examined to ensure teachers are properly equipped with the knowledge, skills, and ability to carry this out. Preston (2001) believed that the amount and type of training teachers are receiving around integrating digital technology into their practice could be a barrier. For teachers to integrate valuable learning of digital technology in early childhood education, some believe there is a lesser need for the most up-to-date and expensive digital equipment in early childhood centres, and a greater need to ensure teachers are being taught about digital technology (Blackwell et al., 2014; Gibbons, 2008). During Kesi's study in 2014, teachers expressed a need for increased learning about digital technology and digital tools during teacher training, with some saying they learnt some skills indirectly through the study process, and others saying they needed to seek out extra support from student services to navigate the digital technologies involved with study. So it is being recognised by teachers that the training they are receiving is not quite enough for the teaching environments they are expected to create and teach in. This sentiment was echoed by teachers who participated in a study looking at the implementation of the new New Zealand digital curriculum set out by the Ministry of Education. Teachers in New Zealand who have begun implementing the Ministry of Educations' digital technology curriculum which was released in 2017, have expressed their views that they need clear and ongoing professional development in order to confidently implement the new curriculum (CORE Education & Ministry of Education, 2017). In a 1986 study, Edyburn and Lartz found that 76% of teachers felt the in-service training they had available was inadequate. In 2006 Chen and Chang discovered during their study that 48.3% of teachers participating in the study had one day or less professional development around digital technology in the three years prior to the survey, while 32.7% had between two and five days and 19% had more than a week. It would appear that despite the increase in digital technology within society and the increased pressure on teachers to reflect on digital technology within their practice, there had been little change to the training given to teachers in order to address digital technology and its place in the world children are living in, or its place within an early childhood education setting.

Some have noted a lack of teacher training around uses of digital technology in the early childhood education setting, but there is also the understanding that digital technology can be a tool used for teacher training. The ability to complete teacher training online has been growing (Donohue, Fox & Torrence, 2007; Fox & Donohue, 2006). One of the effects the online training of teachers is having is the creation of support networks between students who are studying online, where they offer each other support and ideas, share knowledge (Fox & Donohue, 2006), and build a strong sense of community with other teachers who are training online (Donohue et al., 2007). This could create

strong networks of teachers, reflecting together and creating communities of learning among teachers.

Through digital technology, early childhood teachers may have the opportunity to form a closer professional relationship with other teachers, and contribute in new ways to the professional conversations both nationally and internationally. Teachers may have a much greater way to share ideas and to professionally support each other via the internet (McMurtry & Burkett, 2010). In New Zealand there is professional code and standards which are set out by the Education Council of New Zealand, which asks teachers to "seek and respond to feedback from learners, colleagues and other education professionals, and engage in collaborative problem solving and learning-focused collegial discussions" (Education Council of New Zealand, 2017a, p. 18). Through the use of the internet and other digital technologies, teachers may be able to have these conversations and interactions much more easily and with more professional input. Teachers around the world are able to support each other professionally and are growing a large community of professional discussions. Registered and registering teachers in New Zealand are asked to be "engaging in conversations about developments in education and best practice for teaching and learning" (Education Council of New Zealand, 2017b, p. 5). A teacher may be more able to contribute to a learning community via the internet, using various digital technologies. The use of digital technology will allow for teachers to have professional conversations on a scale greater than their immediate teaching community. Teachers will have more opportunity to engage in professional discussions that will allow for greater depth of professional reflection. The role of a teacher as a reflector of practice, and a teacher's ability to grow professionally, may have an added dimension with the addition of digital technology.

2.10 Conclusion

There are many ways to approach the curriculum being offered in early childhood centres, and many different beliefs about what is the correct way to achieve quality. Digital technology is being incorporated in policy and in practice in increasing ways, while remaining open to the possibility that some may choose not to incorporate it into their practice. While there is still debate around what is beneficial and what is detrimental in terms of digital technology with young children, there remains a need to allow for early childhood education settings to decide for themselves whether they will incorporate it into their practice. One of the best ways to look at any issue in education, and a way to support teachers and centres, is the practice of self-review; informed self-reviews of individual practice, informed self-review of centre practice and policy, and informed reviews of digital technology and its use within the centre. As with many aspects of education, digital technology and its place within centres is an individual centre's choice based on its self-review, and is an area that will need to be reviewed regularly. Teachers as professionals have the right and

responsibility to review their practice and make any changes, or stay the same, based on their self-reviews.

Chapter 3: Visual phone calls?

3.1 Introduction

While digital technology in general is a huge topic, it must also be recognised that there are different tools and different uses for the digital technologies available. Video conferencing is one way of using different digital tools to create a new approach for the way people can communicate with others around the world. As with the individual tools themselves, it is up to teachers to decide what is beneficial for children and what is not. Teachers need to determine what, if anything, video conferencing could offer children in their early childhood setting. This chapter analyses some of the benefits and downfalls of video conferencing in relation to its use with young children, as well as exploring some of the possibilities available.

As the focus of this particular research project is the use of video conferencing in early childhood from teachers' perspectives, it is vital to have some understandings around different issues and ideas relating to video conferencing. This ensures a solid foundation of knowledge on the topic being researched. In this chapter, video conferencing is described, some of the concerns and benefits are explored, the ways it is currently being used in early childhood education are described, and the possibilities it could hold for use within early childhood settings discussed.

It is important to note that at the time of this research, there had not been many studies conducted which related to video conferencing and its use with young children or its use in early childhood settings. This did make it more difficult to find relevant research for this chapter. However, links have been made between the research available currently specifically on video conferencing, and research is available in general on early childhood education. This allowed for added understandings around video conferencing in early childhood education.

3.2 What is video conferencing?

There are many different ways digital technology can be used, and video conferencing is one. Video conferencing " is a technology which enables us to communicate directly, both in sound and in vision, with other pupils and teachers who may well be on the other side of the world" (Williams, 2001, p. 117). "Desktop videoconferencing offers accessibility to off-site locations through high-quality audio and video connections" (Gibson, Hopper, Pennington & Stenhoff, 2010, p. 215). Video conferencing is, "a way to use the video-recording capabilities of various devices to support real-time interactions across the internet" (Nemeth & Simon, 2012, p. 106). Put simply, video conferencing uses the digital tools of a screen, microphone and speakers, and the internet to communicate using video and voice, in real time and from any location that the internet allows. It requires both parties of the video conference to have a web cam, microphone, speakers, and suitable

internet connection (Gibson et al., 2010). Video conferencing is one way of communicating using current digital technology.

Aside from the aspect of the tools or specific technology involved, video conferencing is a means of communication. It is a means of building and maintaining relationships with others.

> In an increasingly globalised world, where migration is becoming more commonplace, finding ways of maintaining relationships with close, extended family members becomes problematic. The development of computer technology and the availability of free software such as Skype, which enables remote communication over temporal and spatial distance, mean that the computer can potentially be used in some homes for maintaining family relationships across geographical and generational boundaries. (Kelly, 2013, p. 2)

Video conferencing is a way of keeping in contact, of forming and maintaining relationships, and an added means of communication over a long distance to what was available prior to this technology. It allows for back and forth conversation of both verbal and non-verbal means of communication, which is a different experience to verbal communication over the telephone where the interpretation of what is being said relies on the words and tone being spoken by those involved alone.

There are many different products associated with video conferencing, such as Skype, FaceTime, Whats App, Facebook, and Google Hangouts. These are some of the providers of video conferencing applications. Providing both users have the digital technology necessary, these applications can be freely accessed and the video calls made and received will also be free, with the option of purchasing a 'better' package in some cases.

3.3 Benefits of video conferencing

Video conferencing is not a topic that had been researched a great deal at the time of this research project. In this chapter some of the benefits from research that has been conducted are discussed. Many of these relate to the benefits noted for early childhood teachers rather than the children themselves, although benefits for teachers may directly and indirectly affect the children they are teaching and the early childhood centre they are teaching in (see for example, Winsor & Blake, 2010; 21st Century Learning Reference Group, 2014).

One of the benefits of video conferencing may be the ability to interact with people who are not be as easily accessible for face-to-face interactions. One example of this is access to early intervention specialists. Gibson, Pennington, Stenhoff, and Hopper conducted a study in 2010 which highlighted benefits for children with additional needs, and their teachers who trialled the use of video conferencing for 'meetings'; some of those benefits included accessing specialists more easily and

more frequently, and a reduced cost of specialist care due to the removal of travel time and costs. Children with additional needs and their teachers may be able to access more regular support, and more thorough conversations and meetings if the need for travel were removed. This may mean those in rural settings who have little support from specialists can access these specialists without the need for travel (see for example, Gibson et al., 2010). This could allow for early childhood teachers to create a more inclusive setting where children with additional needs can be given more meaningful experiences as the teachers are guided more regularly by specialists. A teacher involved in one study expressed the opinion that using video conferencing allowed for the specialist to observe the teacher and understand how the intervention was working and offer advice and feedback to the teacher more easily (Gibson et al., 2010). This suggests that with the use of video conferencing teachers will not only have more frequent access to the support of specialists, but that support may be more meaningful when the practices of the teachers are observed and discussed while teachers are interacting with children in their centres.

As families and early childhood teachers are responsible for the care and education of young children, communication between those adults is important to ensure connections between their immediate environments of home and school are strong and relevant to the individual child (see for example, Arthur et al., 2005; Berk, 2003; Bronfenbrenner, 1994). Video conferencing could allow for an added means of communication between the teachers and the families of children to strengthen relationships when face-to-face meetings are not possible (National Association for the Education of Young Children & Fred Rogers Centre, 2012). Video conferencing offers an additional means of communication available to families and teachers to build and strengthen their communication.

A key element of video conferencing that is not present with telephone or email communication is the ability to see the other participant. Young children who are learning to communicate will often use gestures with one or two key words in order to make themselves understood (Berk, 2003). When using video conferencing, the other person involved in the conversation is able to see those gestures and it may make communication easier and less frustrating. Body language can be seen, although only what is being captured by the camera. This may mean the meaning behind the spoken word is easier to grasp as facial expressions may allow for greater understanding of the speaker's emotion. It may also allow for visual expression of the meaning, for example, showing with a hand gesture how big something has grown, or showing with a frown that the other party is not sure what was meant by a comment.

3.4 Challenges of video conferencing

Along with some expected benefits of using video conferencing with young children, there are also some expected challenges. Some of these include timing of interactions, issues with the digital technology itself, a lack of ability for children to use all of their senses during interactions, and possible cultural concerns around using video conferencing for interactions with others. These challenges are all considerations that need to be reflected on when considering the place of video conferencing in an early childhood education centre and are discussed in this chapter.

Timing may be a challenging factor when using video conferencing due to differences in time zones (Nemeth & Simon, 2012). This could make it difficult to find a mutually suitable time to interact. Scheduling time for video conferencing interactions could even be difficult when both parties are in the same communities, due to differences in routine or timetables (Hatherly et al., 2009). There would need to be prior arrangements made for video conferencing with others in any instances to ensure times are suitable in different time zones and for different routines of the parties involved. This could make the delay between wanting to video chat with someone a concern as children may lose interest in whatever their interest was, and it may take some creative scheduling to overcome, such as having morning tea later to accommodate a video chat.

Video conferencing relies on a range of things to be operating in order for it to work most effectively. Some of the challenges of video conferencing relate to issues with one or more of the components necessary for the video conference interaction. During one study involving video conferencing as a means for early intervention, one participating teacher expressed the concern that if the internet server was down, the interaction with the specialist would not work (Gibson et al., 2010). This highlights the issue of digital technology not always being reliable or available. Issues with sound quality also greatly affect the ability to hold a video conference interaction (Pickering & Walsh, 2011). Unfortunately, if the issue is related to the internet service, there is not a lot that teachers can do to solve it. There needs to be planning to find possible solutions or alternatives for any issues that arise. When, or if, video conferencing is used with young children, a procedure needs to be put in place and agreed to by both parties, which includes an agreed strategy for what should happen if communication were to be lost (Gibson et al., 2010). These strategies may need to cover topics such as what to do if equipment fails, such as a screen freezing, and how to respond if communication is lost altogether. These need to be set in place and agreed upon by all parties prior to the video conference taking place.

There are some concerns around how effective video conferencing is for young children who are still developing their communication and interpersonal skills. There is a possibility that due to the

lack of physical proximity, communication using video conferencing may be harder than face-to-face communication, as it is harder to pick up eye contact (Tyler, 2016), and to pick up non-verbal cues (Kelly, 2013) for young children. The sense of touch can have an effect on the way information is understood or interpreted (Robles-De-La-Torre, 2006) and therefore the lack of touch offered using video conferencing to communicate may impact on what and how children learn through such interactions. This suggests that children under the age of two, who are in what Piaget called the 'sensorimotor stage' and learning about the world through active exploration with their senses (Berk, 2003), may not gain as much information through video conferencing, because their senses of touch, taste, and smell cannot be used to explore in the way they would if the interactions with others were in the immediate environment. Touch elicits response from birth, though the use of touch is different in different social and cultural groups (Arthur et al., 2005), so perhaps children who are used to different levels of touch during interactions will gain different benefits and face different challenges when using video conferencing for interactions with another person. There is also a counter argument that children learn through their exposure to language and develop language skills through listening to language (see for example, Arthur et al., 2005; Berk, 2003) which may mean video conferencing can be a valuable tool when used alongside other tools, such as interactive communication with those in the same immediate physical environment.

Another aspect of video conferencing which may need consideration is that of cultural identity and respect for cultural understandings. In terms of New Zealand early childhood settings, Māori cultural understandings of communication may be a factor to take into consideration, as New Zealand has a bicultural early childhood curriculum (Ministry of Education, 2017). While Māori is an oratory culture by tradition, with emphasis put on language as being significant to teaching and learning (Ka'ai & Higgins, 2007), there is also an aspect of spirituality in meeting face to face and sharing the cultural greeting of a hongi (Barlow, 2013). When meeting traditionally in a physical capacity, Māori culture dictates that a hongi takes place, in which people greeting each other press their noses together (Barlow, 2013). "The hongi, the act of pressing noses, has two primary meanings: it is a sign of peace and also a sign of life and well-being" (Barlow, 2013, p. 26). This may be a factor for some early childhood settings in New Zealand, particularly those who follow a strong philosophy of Māori culture and tradition, such as in a Kohanga Reo. It may be that because hongi is seen as a formal greeting (see Higgins & Moorfield, 2007) it is not relevant to video conferencing interactions. It may also be decided by individual centres that the importance of knowledge being passed on through language as is customary in Māori culture (see Ka'ai & Higgins, 2007) is the most important aspect of communication. Either way, any decision relating to

this will be a reflection of a centre's values and beliefs, but it is a consideration that may be relevant to early childhood centres in New Zealand.

During one study done involving preschool children using video conferencing, it was noted that the children found a laptop harder to communicate via video conferencing than an iPad, as there was not the same ease of movement with a laptop (Kelly, 2013). Children were able to interact more easily and involve the other participants in their interests more easily using the iPad (Kelly, 2013). This may mean that equipment may need to be experimented with to find what works best for the children and the environment. This is similar to the difficulties experienced by training teachers who were using video conferencing to observe a class and expressed frustration that they could only see the limited area where the camera was pointing to, and found they wanted to get different views (Pickering & Walsh, 2011). Pickering and Walsh (2011) suggested this could be solved by purchasing more cameras and putting them in different areas. However, more cameras means more cost, more set up and more equipment that could stop working. It may be that with the current technology available, this is a challenge that can only be minimised through planning, but not entirely eliminated.

3.5 Young children using video conferencing

There are currently not many studies that look at preschool children using video conferencing. One study that has been conducted involved the researcher looking at the interactions she had with her two young grandchildren who lived in another part of the world (Kelly, 2013). During this study, Kelly found that the younger child would forget that actions not done in front of the camera could not be seen by those on the other side of the interaction (2013). According to Piaget's theory, young children are unable to comprehend the idea that others do not have the same views, understandings, or knowledge that they have (Crain, 2000), therefore they may struggle to realise that what is happening for them in their environment may not be known or experienced by participants on the other side of the video conferencing interaction. Siraj-Blatchford and Siraj-Blatchford found through their study in 2002 that the ability of children to understand that others may not have the same knowledge, information, or understanding as they have, has a direct impact on how they use, understand, and interact during video conferencing communications. Kelly (2013) also found during her study that the younger of the two children involved was more likely to want to physically interact with the person on the other side of the camera, whereas the older child understood the limitations of the interactions. This is an area that may need the input of adults to assist in elevating the frustrations and ensure smooth communication where possible.

One aspect of Kelly's 2013 study of preschool children using video conferencing to communicate that was interesting to note is that the encounters were " a familiar cultural activity valued by her family" (Kelly, 2013, p. 8). This is an important consideration when thinking about the world children are growing up in and the knowledge that they bring to the centre from their home lives. Both Vygotsky's (Berk, 2003) and Bronfenbrenner's (Berk, 2003) theories present the ideas that children learn about what is acceptable, expected, and normal within their culture and society through what they are exposed to and what they see others around them doing (Berk, 2003). It may be that there are a number of children in early childhood settings who are familiar with video conferencing and have grown up using it as a normal means of communication with people who live in different locations. It may also be that most of the children in a particular setting have no prior knowledge of video conferencing. It is very hard to know unless the topic is explored. If some children have more knowledge of video conferencing than others, this could lead to their being able to take leadership roles and help others to learn. Indeed, City of Manukau Trust (2005) found in their study of digital technology in early learning centres, that children who are more experienced with digital technology and digital tools did assist their less knowledgeable peers in activities involving digital technology and digital tools. This idea of children working together, with those who have more experience and knowledge helping their less experienced peers, does fit with the concepts of social learning that Vygotsky presented (Crain, 2000). Video conferencing may provide as much learning through interactions within the immediate centre environment as it does through the interactions with those on the other side of the video conference. Kelly (2013) found that when both of her grandchildren were near each other, they would interact with each other rather than their grandparents, often arguing over who was able to stand in front of the camera. While navigating the use of video conferencing and participating in discussions via video conferencing, children may be learning about how to interact with others through their discussions and interactions with those in their immediate physical environment.

Children need to have adult support when communicating using video conferencing. Adults may need to be asking prompting questions to assist with keeping the conversation flowing, and remind participants of topics to talk about (Kelly, 2013). As with many activities, it is a teacher's role to scaffold the children's learning with digital technology (McDowall et al., n.d.). According to the theories of Vygotsky and Bandura, children may benefit from having assistance to develop new skills with any new or difficult tasks (Crain, 2000). It would seem that in order for children to gain the full benefit of a video conference, adults need to be hands-on facilitators, scaffolders, and supporters of the children's learning experiences.

3.6 How video conferencing is currently used in early childhood education

There is not much literature or evidence of video conferencing currently being used within early childhood education settings. One idea that has begun to be used by teachers, is using video conferencing to gain further skills or knowledge for teachers within their practice. During one study, consultants used verbal instructions and modelling to teach the teachers new early intervention techniques, and to observe and provide verbal feedback as teachers were using those techniques (Gibson et al., 2010). Another study found video conferencing was being used to ease transitions to school, as children were able to see their future classroom and 'meet' their future teacher and classroom peers (Hatherly et al., 2009). During the course of the current research project, very few examples of video conferencing in early childhood settings were found. This lack of literature around the using video conferencing with young children and in early childhood educational settings was also noted by Hatherly, Ham and Evans in 2009. It appears that the pool of literature looking specifically at video conferencing has room to grow and develop. There have been a few more studies, such as that by Kelly in 2013, and Pickering and Walsh in 2011, but most of the work around digital technology in early childhood education remains very broad and mostly concerned with the philosophical and pedagogical issues around general digital technology.

3.7 Possibilities for future use of video conferencing in early childhood education

"Like all information and communication technology tools, videoconferencing is completely neutral…it rests with the user whether or not any value can be gained from its use" (Williams, 2001, p. 116). Following that thought, the possibilities for video conferencing may be many.

One possible use is for teachers to create a strong and supportive professional networking system. Teachers could video conference with other teachers or relevant professionals to further their knowledge, gain support, offer knowledge and support, and to feel more in touch with the profession as a whole. Bolstad (2004) mentioned in her review of digital technology in early childhood, that video conferencing has the potential to be used as a way to exchange ideas and information with people outside of that particular early childhood service. Teachers have the possibility of networking and sharing professional resources and learning more easily using digital technology (City of Manukau Education Trust, 2005), and that could possibly include video conferencing.

One way for teachers to build confidence and familiarity with video conferencing and the digital tools involved, is to practise together, as suggested by Gibson, Pennington, Stenhoff, and Hopper (2010). There are many theories that suggest learning in a social environment and sharing knowledge and expertise is an appropriate way to gain more skills and knowledge (Berk, 2003;

Crain, 2000). This sharing of knowledge may, in the case of video conferencing, include children learning from those around them, as well as adults learning from those around them. Video conferencing may be a new form of communication for many in an early childhood centre, so children and adults may be learning about it at the same time (see for example, Kelly, 2013). To truly believe in the importance of lifelong learning, teachers need to also continue their learning, including learning about new digital technologies and resources, and be willing to learn with and from those around them.

Virtual field trips are another possibility for uses of video conferencing. Virtual field trips use a range of digital tools and techniques to allow exploration of different areas without children having to travel to those places (Kirchen, 2011). Video conferencing may allow early childhood centres to 'visit' places through being shown those places via a video call to someone at that location. This could provide access to areas that may not otherwise have been available, and may allow children to discover information that would be hard to discover otherwise (Kirchen, 2011). However, Kirchen (2011) does warn that if at all possible, hands-on experiences should be utilised before using virtual experiences, and that virtual experiences such as virtual field trips, should be accompanied by appropriate pre and post field trip experiences just as any other field trip would. This can be important as children learn through all of their senses (Berk, 2003) and through active exploration (Ministry of Education, 1996). This reiterates the idea that video conferencing is one tool to be used alongside other tools to create learning experiences for young children.

Video conferencing allows for the possibility of children interacting with children in other areas. Williams wrote in 2001 about a study where two schools who were in different locations globally shared information and experiences using video conferencing. The two schools worked on joint projects and found that it worked very well (Williams, 2001). Two key points that were thought to play a big role in the success of these two schools working together, were that they set up their interactions using email communication before video conferencing each other, and that both schools had appropriate working equipment and understood how it all worked (Williams, 2001). This shows that when used appropriately, video conferencing may have the potential to allow for children in different settings to learn together and share knowledge and understandings. It is also a good example of using more than one means of communication to ensure successful learning relationships.

3.8 Conclusion

Video conferencing is a fairly recent development in the world, and as such it is still not widely used in daily life, and has not been studied greatly for use within early childhood education. As with

many tools and technologies, video conferencing has its benefits and its downfalls. There may be great potential in the uses of video conferencing within early childhood settings, if used for valid purposes and with well-structured policies and procedures. The more common video conferencing becomes, the more its positive and negative potentials will be understood and realised. It may be a valuable tool to be used alongside other tools for the potential of learning and for connecting with others and building wider and stronger communities. It may also be a tool that creates confusion for young learners and has no impact on their learning or sense of belonging in the world. As with many other tools, it could well depend on how it is used and why, as to what potential video conferencing holds for the users.

Chapter 4: From curiosity to project – the method

4.1 Introduction

"All research begins with some kind of curiosity" (Tolich & Davidson, 2007a, p. 90). This research began first with pondering why, in my twelve years' experience working within early childhood education, digital technology is seemingly absent from early childhood centres in New Zealand. With an increase of digital technology in daily lives outside early childhood centres, why does the most common experience for children's early childhood education, in my experience, amount to a computer stuck in a corner? This reflection of my experiences of digital technology and desire to explore the topic further came about while reading for a paper at university. Digital technology is something that is present in the personal lives of my family, but which I had not thought too much about during my professional life as a teacher.

This chapter provides an outline of the processes used to research my initial pondering in a meaningful way that can be useful to others who may ask similar questions. In this chapter, an explanation is given as to what the guiding question of the research project has been, along with how this question was raised. A description and analysis of the method that guided this research project is given; the chapter then looks at the data collection methods and how participants were invited to be involved, and how data were used to create a meaningful piece of research. The process of ethical approval is also described, as well as the limitations faced when conducting this research.

4.2 Research questions

One of the underlying goals of this research is to add to what is already known on the topic of video conferencing in early childhood, and, hopefully, to initiate new conversations within the early childhood sector. This initial question of why there seems to be an absence of digital technology in early childhood education was found to be a complex question with no one answer but a lot of contributing factors, as described in chapter 2. The initial question led on to wondering what skills teachers of young children have with digital technology, and what their thoughts on digital technology in the curriculum were. Using the researchers' personal experience as a mother and professional experience as an early childhood teacher, the basis of this research looked at a particular part of digital technology which seemed, in my experience, to be growing in daily life: video conferencing. After some initial reading on digital technology in early childhood and reflecting on personal experiences within centres and with raising my own children, the main question that guided this research, was what are teachers' perspectives of video conferencing? This was a question which was feasible as it could be answered using tools and methods available to the researcher, and the feasibility of the research question is very important to the project (Fraenkel,

Wallen & Hyun, 2012; Wiersma & Jurs, 2005). The guiding question asks for teachers' perspectives, and it was within my ability to seek out teachers who would like to participate and provide data, which made the task feasible. I was able to find participants and find out their perspectives through asking them, and none of that task required any equipment or skills that I could not access or be supported in learning about, through study. The questioning that shaped and guided this research project followed the sequence described by Punch (2009) where I asked a general question (why is digital technology not often present in early childhood settings in my experience?), that was followed by more in-depth and specific questions including the question guiding the project. Other questions were what are teachers views of video conferencing in early childhood settings, along with other relevant questions including: what do teachers know and believe about digital technology, what do teachers know and believe about video conferencing, how do these views and understandings affect their teaching practice, and what they offer to children within their settings? Having strong and clear research questions is said by some, including Fraenkel, Wallen and Hyun (2012), and Punch (2009), to be central to a research project, as the question will guide the rest of the project, becoming the starting point from which to work. With this project, defining strong questions was the first step. Having a clear guiding question was a crucial factor to allow other details to be decided, such as how to conduct the project, what methods and methodologies would work the best for this project.

4.3 Methodology

The researcher holds the personal view that understanding the views of those involved in the area being researched is of high importance. Fraenkel, Wallen, and Hyun (2012) described the qualitative process as, "qualitative researchers … assume that the world is made up of multiple realities, socially constructed by individual views of the same situation" (p. 10). The underpinning goal of finding out what teachers' perspectives of video conferencing are, dictates that teachers are the source of the data being collected. While understanding that there is a place for numbers and statistics (i.e. quantitative research), this research project seeks to understand the topic from the views of those involved (i.e.qualitative research). Qualitative research looks at specific experiences and understandings of the research participants (Tolich & Davidson, 2007b), and focuses on people and what the human experience is, including the knowledge, beliefs, and values of individuals in society (Johnson & Christensen, 2012; Somekh et al., 2011). In this research, each participant was asked what their beliefs around digital technology in early childhood were, what their experiences of video conferencing were, and what they considered to be the positive and negative impacts of video conferencing in an early childhood setting. The basis of this research question is in the practice of early childhood education, and based on the understanding that it is the teachers

themselves who influence what is taught, and how. For example, Damoory (2015) reflected on her own experiences of integrating digital technology into her teaching practice and realised that not only was it her own beliefs that prevented her success in integrating digital technology into her teaching practice, but also, that her attitude also affected other teachers, and when she displayed positivity towards digital technology, so did her fellow teachers. This example shows how important and influential teachers' views are to the functions and decisions made in a centre.

The point of view of this research holds a place in phenomenology as the researcher holds the view that the influence of the experiences and understandings of the teachers themselves has an important impact on the curriculum as it is delivered in early childhood centres. With a phenomenological view (as is the view of this research project), participants' own views, beliefs, and understandings are crucial to understanding the situation. A description given by Fraenkel, Wallen, and Hyun (2012) explained that "a researcher undertaking a phenomenological study investigates various reactions to, or perceptions of, a particular phenomenon…the researcher hopes to gain some insight into the world of his or her participants and to describe their perceptions and reactions" (p. 432).

Initially, an action research project seemed like the best way to get a better understanding of the potential for finding out more about video conferencing in early childhood. However, after a discussion with my research supervisor, and more reading, I realised that not only would I not have the time needed to complete enough cycles for an action research project, it also unlikely to give me the answers to the questions I was looking at, as teachers may not even have the experience with video conferencing that I would need them to have, and may not want to implement it in their centre. What I really wanted, and needed to know, was what teachers believed were the benefits of video conferencing with children in early childhood settings – so I needed to know what their views were and their current ability to use video conferencing. A phenomenological approach seeks to find out what participants know and understand based on their experiences of the world and draw a deeper understanding from the information gathered (Fraenkel et al., 2012), which is what I was really wanting to do with my research. Teachers' views are seen in this research as not only important, but highly influential to the issue of video conferencing in early childhood settings. Teachers are an important part of the curriculum delivery, and therefore, they need to find a balance between the potential negative impact of any digital technology used within a centre, and its potential benefits (National Association for the Education of Young Children and Fred Rogers Centre, 2012). Teachers' views and beliefs can impact on how and why centres operate the way they do (see for example, City of Manukau Education Trust, 2005; Damoory, 2015; Hatherly et al., 2009), and teachers are expected to create learning environments that prepare children for the future (Yelland, 2007). This research placed high value on what the teachers themselves believed and

understood, as the guiding question centred on the teachers' perspectives. Phenomenology as an approach in education is concerned with the understandings created by looking at the experiences of individuals (Ozmon & Craver, 2003). With this approach, researchers assume that the views expressed by one participant may well be experienced by others experiencing the same phenomenon, thus leading to common themes or understandings about society (Johnson & Christensen, 2012). With this research project, the data gathered from participants was used to find not only individual experiences, but also common experiences and beliefs within a professional body.

4.4 Staying small to stay focused

During the research process, there were times when goals were set too high and the limitations were set too broadly. If the project became too big, the quality of the data gathered and the time available to work with the data would have been reduced, which would have most likely resulted in poorer quality research. Part of the job of a researcher is to put limits on what is necessary to reach the desired goal and what is needed to create a worthwhile research project. In order to achieve the goals, both of contributing to the early childhood sector and gaining a qualification with the available resources, the research needed to be a small-scale research project. As Punch (2009) pointed out, "there are limits to what can be done in any one project, and most experienced researchers and research supervisors would agree that it is better to have a small-scale project well done than a bigger project superficially done" (p. 42). As a student researcher, the scale was one of the major hurdles faced during this project. Through conversations with the research supervisor, it was therefore decided that this project needed to be a small-scale project in order to provide the best quality information for the wider early childhood community.

4.5 Data collection

For this study of teachers' experiences, interviews were considered to be the most appropriate method for data collection. Questions can be predetermined as a guide to gain specific information, such as what the individuals' previous experience with video conferencing was, and participants needed to be able to describe their ideas and perspectives as they desired. Punch explained that "the interview is the most prominent data collection tool in qualitative research. It is a very good way of accessing people's perceptions, meanings, definitions of situations and constructions of reality" (2009, p. 144). In asking questions, participating teachers were encouraged to talk about their personal views and experiences. Interviews of depth allow for a purposeful interaction between researcher and participant, in which the researcher attempts to find out what the participant has experienced and what their thoughts, ideas, and beliefs on a given topic are (Mears, 2012). For this research, it was important that teachers were able to discuss their personal experiences, views, and

beliefs without the concern that they would be ridiculed or reprimanded because of what they disclosed. For this reason, the research data were collected by holding individual interviews with only the researcher and the participant in the room at the time.

The interviews were conducted in a semi-structured way, meaning that there was a set of predetermined questions, with time and allowance given to ask further questions during the course of the interview (Gall, Gall & Borg, 2007; Tolich & Davidson, 2007b). It was important to make sure the participants had the time to add anything they felt was important and that they knew they were valued and listened to.

During interviews it can be difficult and distracting to take notes while trying to hold a conversation, and there was a concern that important information could be missed. To eliminate these issues, the interviews were recorded using a voice recorder and transcribed afterwards by the researcher. Using a voice recorder is helpful because it allows an entire interview to be captured without the interviewer selecting what to record or leave out, and allows the conversation to flow freely (Fraenkel et al., 2012; Gall et al., 2007).

One aspect of interviews that is crucial is the trust and relationship built between the interviewer and interviewee. Teachers being interviewed may feel they are being judged or criticised on their answers and not give their full opinions based on this assumption of criticism. Having a trusting relationship between the two parties can make a big difference in the quality of data gathered (Gall et al., 2007). With this research, there was little time spent with participants prior to the interviews, meaning that not a lot of time was available to build a trusting relationship. In order to make up for this, full transparency was used as an approach. Participants had the opportunity to have the research project details explained to them, to ask questions, and to opt out if and when they wanted; they were also offered written information on the project, as well as having their confidentiality guaranteed. This is a key component in the research process, in which the researcher is honest and transparent about all aspects of the research project and possible participants given written details and information (Nolan, Macfarlane & Cartmel, 2013). Participants were assured prior to giving consent that confidentiality was of high importance, and was taken very seriously, which was another aspect of gaining their trust. An application for ethical approval had to be submitted to AUTEC (Auckland University of Technology Ethics Committee), outlining what was to be done and how, and ensuring that the participants' rights would be protected. This is detailed further down in the ethics section of this chapter.

4.6 Recruiting participants and conducting interviews

As part of the planning process for this research project, it was important to consider where participants would be recruited from, and how. As the views of early childhood teachers were held in high regard by the researcher, the research questions, and the methodology, it was a logical step to recruit teachers currently working in early childhood centres. Further to working in centres, the teachers needed to be working in an area near to the researcher's base, partly for logistical reasons and partly so the researcher understood the community the teachers were a part of. Seven full day early childhood centres in the area were offered a chance to participate, but only two local centres took that opportunity and agreed to their centre's staff participation. I took information in to those centres and at each centre, the managers offered me the opportunity to go to the staff members who were working at that time, and explain what I was doing. This allowed me to get an indication of who would be interested and gauge whether or not there would be enough teachers willing to participate. It also allowed me to personally explain the written information I was leaving for them to read.

As this research sought the views of all teachers working with young children, I decided that levels of formal training or years of experience had no bearing on the ability of participants to participate. The views of all participants were considered relevant as they are the people who are implementing the curriculum and working with the children and families within their centre. For this reason, teachers were not asked about their qualifications or level of experience. All teachers working in the two participating centres were invited to join. In total, nine teachers agreed to participate and were interviewed for this project.

To set up the interviews, email correspondence was used between myself and the centre managers. As they knew the routines of their centres, they were able to advise me on the best time to visit the centres and conduct interviews. Dates and times were set that I would be in the centre, and then when I arrived staff who wanted to participate were offered time to be relieved of their duties and meet with me to be interviewed. This worked well as all staff had been given an opportunity to read the information I had provided, to ask questions, and to consider the implications of their participation. Centres were able to decide which times worked best for them, which allowed for less interruptions during interviews as centres had found times that worked best for them for this purpose.

There was a small concern that the voice recorder could create some discomfort for the teachers being interviewed (See Gall et al., 2007), which was addressed by explaining to the participants exactly what the process would be, as well as by using a small recording device and positioning it

between the participant and researcher so once it was turned on it did not need to be touched again. The participants only mentioned their discomfort of being recorded at the very beginning of the interview, if at all.

Once the interviews were completed, they were transcribed into written form. This took quite a long time and highlights how much would have been missed had a voice recorder not been used. Once transcribed, the voice recording was deleted and notes were taken from the transcriptions.

4.7 Analysis

When compiling the data and reviewing it, the data were treated thematically, by systematically looking for themes that were common in the responses given by participants. Themes were looked at to get a bigger picture of the beliefs of teachers on particular topics. In this way, comparisons could be made between the views of teachers on particular subjects. This process is called coding. Coding involves sorting data into categories (Johnson & Christensen, 2012; Wiersma & Jurs, 2005), and often leads to relationships between codes emerging, and new codes being added as overlaps happen within the initial codes (Johnson & Christensen, 2012). This is again in line with a phenomenological approach, as participants have individual experiences but are within the same community, so similarities can occur due to something having significance to the wider group as well as to the participants on an individual level (Johnson & Christensen, 2012).

One aspect that was noticed during the coding process was the fact that during interviews, more questions could have been asked of participants to clarify their responses and ideas. The main reason for this was an awareness of time constraints. All interviews were conducted during work hours in private areas of the centres and teachers were not able to be absent for very long. This was the way that centre managers thought would work best with their staff and centres. The other reason for this was a lack of prior experience of conducting this type of interview on the interviewer's part. While the literature review had already provided a solid base of knowledge on the topic (See Tolich & Davidson, 2007b), and the need to ask spontaneous questions was noted from reading on conducting research interviews (See Gall et al., 2007; Tolich & Davidson, 2007b), conducting interviews in practice was a new experience and reflected in the type and amount of questions and discussion with participants. However, the predetermined indicative questions had gathered enough information to continue without the need for repeating the interviews and still maintain the research goal.

The purposeful absence of information on the individual participants' levels of formal teacher training or experience meant that when looking at the data, all data were treated as equally relevant

to the topic. There was no judgement made on qualification level or ability to deliver curriculum. The data were approached with every participant being on an even level in terms of their role in teaching young children and delivering early childhood education to children under the age of five. The only comparisons made were directly related to the information shared by participants and their relation to relevant literature.

4.8 Ethical approval

Ethical approval was sought and gained through AUTEC (See appendix 1 for the ethical information for this project). The process of applying for ethical approval can help a researcher anticipate any possible problems, and plan solutions to these (Piper & Simons, 2011). Ethical approval must be sought, and approved, before any data gathering can commence. This allows the researcher to go through and ensure they have a clear picture of not only what they are undertaking and why, but also how they plan to do it.

This research project sought the views of teachers, and because of this, the participants needed to be confident that they would be protected from any potential harm or negative repercussions. The researcher must plan to protect participants from any potential harm that their participation may cause (Fraenkel et al., 2012). The plans must be thoroughly thought out and planned for within the ethics application before the project is allowed to begin. Part of ensuring the participants' confidence was allowing them plenty of time to consider the research, their role within the research, and the steps taken to protect them. Along with this, the project and processes used were described and discussed at the initial introduction and again before each interview. The transcriptions were also sent to the participants after the interview with another prompt to ask questions, raise concerns, or withdraw if desired. A few teachers were concerned that their name would be used, but they were happy to continue participation once they were informed it would not.

One way to ensure research is being conducted ethically is to treat all potential participants in a respectful and sensitive way and to build trust by remaining honest and truthful from the first interaction with potential participants (Nolan et al., 2013). In order to do this, I explained the entire process to date, including the ethical approval process and what work I had already done on the project to assist in protecting the participants. I explained my motivation behind the research and what I personally wanted to gain – namely a better understanding of teachers' views and to further my own knowledge. I also explained to the participants the steps that would be taken from the point of the initial conversation. An important part of being honest and truthful is to give potential participants all relevant information. As Snook pointed out, "researchers are obliged to deal with their participants and their research community in an **honest and truthful way** (emphasis in the

original text)" (2007, p. 75). This allows participants to fully understand what the project is about and what their role will be, allowing them to give informed consent should they choose to participate (Nolan et al., 2013; Piper & Simons, 2011; Snook, 2007). Informed consent allows participants to consider implications for themselves before they participate in the project. I gave all participants a copy of the participant information sheet (see appendix 3) and the consent form (see appendix 4) and allowed them one week to think over whether they wanted to participate or not.

One of the ways to maximise ethical treatment of and a level of protection for participants, is to maintain confidentiality. There are a number of ways to do this, but one of the most important is to ensure that participants' personal information remains confidential. Snook (2007) stated that "researchers are obliged to record, analyse and publish their data in ways which prevent the recognition of individuals" (p. 78). With this research, pseudonyms were used for the names of participants. The real names of the teachers were removed to ensure they are not published at any time (See Fraenkel et al., 2012). The purpose of this was to make the research findings easier to read while retaining the confidentiality of the participant centres and individuals. Centre names were to be changed, but it was not required, as during the writing up of the thesis, it was found that centre names were not needed.

Another ethical consideration is data storage. Data need to be stored in an ethically responsible way and only accessed by the selected people (Snook, 2007) who the participants are aware will be accessing it, in this case, the researcher and research supervisor. The voice recordings of the interviews were destroyed once the interviews were transcribed and all information was stored in a designated storage facility at the Auckland University of Technology campus.

One of the key components in ensuring the ethical considerations are met is the informing of the participants. Not only are participants required to give ethical consent, but they retain the rights to withdraw from their participation at any time (Fraenkel et al., 2012). In an ethical application, the researcher must make plans for how to respond if a participant withdraws after the data collection has taken place. During this particular project, no one withdrew at any point, therefore all data collected could be used. Had a participant chosen to withdraw, their information would have been removed from the researcher's work and destroyed.

In the case of this project, ethics approval was sought (see appendix 1) and permission obtained (see appendix 2) as a part of the processes of the project. There were no changes made to the research question or method during the course of the project and all participants maintained their interest in

the project; ethical integrity was maintained, as the plan laid out in the ethics application (see appendix 1) was adhered to.

4.9 Limitations

There were some limitations faced by this research. Firstly, only two centres agreed to take part, and both were in rural settings half an hour from each other. This meant that there was not a wide variety of communities in the project, and results may therefore be most relevant to a particular centre, or to small rural towns. This is not a major limitation for this research project, because as a phenomenological approach was taken, the small scale can mean richer data, but it may be a limitation when looking at the results as a bigger picture, and when using it in relation to other centres. In this case, this research would need additional research added to make it relevant on a wider scale. Secondly, due to staff being relieved of their duties for short times to allow for more interviews, making each interview time relatively short and some were interrupted due to issues arising within the centre. This did mean interviews were shorter than anticipated and little time was available to build on answers given by participants. Thirdly, due to the inexperience of the researcher and the researcher's own desire to ensure participants did not feel they were being interrogated or judged on their answers, follow up and impromptu questions were not asked as much as they could have been. This does mean there is room to research further in the future. These were the main issues faced during the data collection for this project. With these limitations in mind, it is relevant to remember that the findings presented in this report are relevant to the centres and participants who took part, although the findings still hold important information about the topic for the early childhood field in general and assumptions can be made as to where this could lead in the future. This research can also be used by early childhood educators and centres as a basis for reflection on their own practice. While there were limitations, none was so great that they prevented this project from being relevant and serving the purpose intended.

4.10 Conclusion

Research projects take a lot of planning and preparation before the research itself begins. For this research project, planning and preparation led from the initial idea of using action research to a change in favour of a phenomenological study. Having clear guidance through the use of procedures, protocols, and ethical expectations can be helpful for ensuring the project reaches its goals in the best possible way. During the process of planning the project, it became clear to me that the participants' views were best found through interviews. The research process itself is as important as the data gathered. The process used during this research processes ensured that centres and individual participants were kept well informed and had the option to withdraw at any time. It also allowed for participants' identities to remain confidential and maximised their protection. Data

were gathered through interviews which were then transcribed, and the results were analysed in a thematic way to create an understanding of beliefs and values that were held by the teachers in general. The method used for this research project has been thorough and thoughtful.

Chapter 5: Teachers' voices – what they shared

5.1 Introduction

For this study, which sought to understand teachers' perspectives of video conferencing in early childhood education, participation was sought from teachers who were working in early childhood settings. During the data collection phase, the participants were involved in one on one interviews with the researcher. The purpose of the interviews was to find out what teachers' perceptions and experiences of video conferencing in early childhood were, using questions about relevant topics such as digital technology in general and views on community importance. The qualification level or teaching experience each teacher had was not recorded as it was not deemed relevant for the purpose of this project. This project sought the views of those working as teachers of young children, and all teachers interviewed were working in early childhood centres with young children, and therefore met the criteria for this project. In this chapter, the participants' responses are summarised, with each teacher's perspectives being given its own section. The chapter looks at information given by participants, with no discussion about the relevance to current literature, or assumptions as to the implications. The findings presented in this chapter are discussed and analysed in the next chapter (Chapter 6: What does it mean). The information in this chapter was gained during the data collection phase of the research project, in which nine participants were interviewed one at a time to gain individual responses, understandings, and beliefs on the topics. The participant names used, as with all discussions involving participants in this research, are pseudonyms, to maintain confidentiality and protect the identities of the participants. After discussing the data gathered from each individual participant, there is a section which discusses the key themes that emerged from the combined information from all participants. The discussion in chapter 6 focuses on the themes that emerged and what they mean alongside what is already known.

5.2 Amy's perspective

Amy described herself as "…experienced but I'm not like a computer whizz…". She has grown up with digital technology being around but has not spent much time using it. Amy talked about teaching herself to use the camera, and about how she had to research the use of digital technology to find out some of the uses, because her initial reaction was that it was all negative and resulted in lazy teaching. Amy could see benefits in using digital technology but she was also concerned that children could get lazy if they only used digital technology. Amy explained that "I do think it's important. But it does have its disadvantages where it's, like, everything is maybe too easy. Like with calculators and with everything there they don't have to retain that much information". Amy felt that digital technology has its uses but should only be used for educational purposes, such as phonics. In Amy's experience, children used digital technology at home and they displayed that

knowledge in the centre through their play and through discussions about what they did at home. Amy felt links between the early childhood centre and the home and community environments were important, but mentioned that she had not seen many connections between her centre and the other environments children were a part of. Video conferencing was not something Amy had had experience using in her personal or professional life and at first she was not sure exactly what video conferencing was, so asked for clarification. She then said she had seen video conferencing used in a centre where she had a practicum, and felt it was something the children enjoyed doing and something they learnt a lot from. Amy also felt that video conferencing could have benefits for education and for "broadening to like the wider world and different things" as well as that children may already be using it at home to keep in touch with other family members. One of the main points that Amy kept referring to was that experiences for children in early childhood centres should be educational. She felt that digital technology was "the way of the future" and that young children needed to learn about it, but that they needed to learn in other ways too. Amy felt that pen and paper activities are still needed and suggested that she learnt well using phonics cards, so children today could as well. She pointed out that a colleague who had recently retired was anti computers and shared the opinion that there is nothing wrong with how things have been done in the past, a sentiment Amy said she agreed with. Amy stated there was a concern for her that, "maybe using it as a, yeah, as an easy way out instead of teaching, but again, I also think if used in the right way it can be very educational, a very positive experience for the kids".

5.3 Bea's perspective

Bea described her knowledge of digital technology in terms of what she used it for. Bea's uses for digital technology in her personal life were practical and administrational, and she described using computers and tablets for "doing my registration and research to back up my ideas and things like that". She explained that digital technology was not used in the baby room where she worked, but it was used for administrative tasks related to planning and learning. Bea did refer to time she had spent with the older children in the centre and how she had used digital technology with them. She described looking up topics of interest that the children had asked about, using the internet and the information gathered with children in other activities such as mat time. Bea said "then later on we came back and I asked them questions about what we had read and they answered all the questions! It was really neat!" She added that every day the children wanted to look up a different topic, and she explained, "each day they had learnt something new. It was really cool. It was really rewarding". One of Bea's biggest concerns with the use of digital technology was the safety of the children. She described the concern she had about pop up ads, saying, "when I'm watching my daughter on YouTube there's options that pop up on the side that could link to other things. I

remember looking up something and then next minute on the side there was something inappropriate and that's what I'm just worried about". She added, "you can't control what comes up on the YouTube thing". Bea felt that digital technology is not as bad as people say it is. She said "I just don't get why everyone reckons it's such a bad thing. I think it's good and it's the way of today isn't it?". Bea felt that children often know more than adults, and described her own experience of her daughter teaching her how to use computers more effectively. When discussing links between the wider community and the centre, Bea was not sure what role the wider community played, but she did describe how the centre had visited the local marae and gained more understanding of te reo Māori through that visit. Bea was familiar with video conferencing and had used it in her personal life to keep family connected, but she questioned why it would be used in an early childhood centre, asking "why would we need to?" and "who would we video conference?" She also said the possible benefit of video conferencing "depends on who we were talking to". Bea showed a lack of confidence in herself, as she suggested she was not providing helpful information during the interview and was worried that she was not sounding clever enough.

5.4 Celia's perspective

Celia initially described herself as anti-technology, quickly changing that to just having basic knowledge compared to her husband and children who were "digital freaks". Throughout the interview she revealed that she used many different types of digital technology for many different purposes, including video conferencing. Celia described how children in the centre had been upset about not being able to use the iPad in the centre "'cause obviously at home they are allowed to use that sort of thing for games or whatever they want to use it for really, whereas in the centre it's obviously a learning tool, so it's about research and information and it's not games." Celia felt that links between the centre and the home and wider community were important and gave examples of how the centre involved the community, including sharing centre activities on social media, requesting resources from the community, offering excess food to the community, and having an open door policy. She also talked about the importance of connecting children's interests at the centre with families, and gave the example of prompting parents to ask their children at home what songs they had been listening to on YouTube while at the centre. Celia also reflected on an experience she had when visiting a local school with a few children and her embarrassment and concern that they did not know what a (computer) mouse was and instead tried to swipe the computer screen. When asked to elaborate on why this was embarrassing and concerning, Celia replied, "because I'm old school…because it's quite obvious it is a computer screen. It's not a swipey thing…like there was no connection in their brain that that worked for because it's obviously not seen". Celia was concerned that children did not know how to use a mouse with a

computer screen. She had had quite a lot of experience using video conferencing in her personal life but admitted that she did not like to use it and would only use it occasionally with her husband. She explained that her reluctance to use it was to do with her lack of confidence when on the screen. When asked about using video conferencing in the centre environment she said, "I'd like to say 'yes' because that's the way the future's going, but I don't think I could". She explained that this reluctance was because of her lack of confidence around being on camera. Celia has also had experience using video conferencing in her professional life and explained that it was difficult, and ended up being "put in the too hard basket", due to the small screens and lack of reliable internet service and speeds at the time. She felt that through video conferencing, children could share ideas with others in different centres, and share what they are learning, and that teachers could share ideas. Celia was worried that video conferencing with other centres would cause her to question what her personal teaching practice is like, and how the centre is operating too much, which she felt could be another confidence issue.

5.5 Daisy's perspective

Daisy described herself as having a lot of experience with digital technology as her generation had grown up with it and it was "part of our generation's culture". Daisy felt that in relation to young children's learning, digital technology is "a vital part of their future", and that it, "broadens their world". Daisy further described how information can be found more quickly, and the information that can be accessed is more up to date when using digital technology. She felt that one of the challenges facing centres using digital technology was the addiction that she believed children have to screens, and the tantrums that could result when children were not able to use screens for long periods in the centre. Daisy felt it was important to balance utilising digital technology while not encouraging the development of screen addictions. Daisy felt that the wider community was important to the centre as it was part of the children's culture and therefore she tried to incorporate the wider community in the centre curriculum through walks and visits to local areas. Daisy believed that children have knowledge of aspects of digital technology through their home lives, and that it was important to link children's learning from home to the centre because, "that's just real life. And that's what we are trying to teach here…so I think they should obviously interweave and that's just an important part of a child's upbringing". Daisy had had experience with video conferencing in her personal life, and expressed interest in the idea of using it in the centre, explaining "I think it's just another aspect of technology that, I guess it is quite new to us but it's probably going to be quite a normal part of life". Daisy felt that children should become confident using video conferencing as it may be used more in the future, but she expressed her discomfort and lack of confidence in using it. As she described, "it's just an awkward concept, just to see yourself

on video talking to someone else, it's just weird". Daisy thought that video conferencing could hold challenges in relation to the privacy of children using it, but could also hold benefits in maintaining existing relationships over distance, and building new relationships with others.

5.6 Eliza's perspective

Eliza described herself as using different types of digital technology both at home and at the centre, but explained that with some aspects she was "not as confident as the other staff." Eliza described her view that digital technology can hold children's interests in topics longer because it was quicker to find information online than in a book. She also felt digital technology could help to build relationships, particularly using video conferencing. Eliza said, "if we used Skype, which we probably should use it more, when a child moves, like if someone moved to a different part of the country, they could still communicate with the others and …it would be quite a good opportunity". Eliza felt that connections to the community were important and talked about how she had taken the children in the centre on excursions to local areas and how she had shared the activities and learning happening in the centre environment with the community through social media pages. She talked about how she believed digital technology was more of a challenge for her than it was for the children. Eliza explained, "I don't think it's a challenge for children because they just do it and if it goes wrong then they just have another go. I think it's more challenging for me because I struggle with technology. I keep thinking about the whole concept about getting it wrong and not wanting to have a whole different concept of it". Her lack of confidence was something that Eliza mentioned a few times throughout the interview, and one of those times was when discussing the possibility of using video conferencing in the centre. Eliza used video conferencing regularly in her personal life, and mentioned that video conferencing should be used more in centres, but when asked if she would implement it within her practice, she replied, "maybe, because I don't feel so confident doing it here with the kids. I don't know. I never feel that confident doing technology". Eliza also pointed out that she did not know if it would work because it might make children feel more unsettled seeing people they missed, such as parents, on a screen. She also felt there could be issues with finding time to video conference, and that there may be too many children to do it.

5.7 Fran's perspective

Fran did not elaborate on her own expertise with digital technology, but instead on her experience as, "children these days are a lot more aware and a lot more capable to, um, experience digital technology". She then went on to explain that a teacher's lack of skills and knowledge with digital technology could be a barrier for teaching young children. The way Fran described using digital technology in her teaching practice was very much around the administrative tasks of learning stories and recording learning moments, although she also described using the internet to find

information with children. Fran expressed the idea that children should not be using digital technology too much, stating, "it is a tool use alongside other tools" She wondered what the effects of using too much digital technology would have on the future of skills such as writing for children. Fran explained, "So we want to use it to support their learning, not to overtake their learning". Fran felt that children needed to have connections between the environments they were a part of, with a two way relationship being built between the centre and the family to ensure continuity of learning. In terms of making and maintaining relationships between the centre and the wider community, Fran felt that "the community is actually a massive part". Fran talked about various excursions to places in the immediate community as well as the wider community of Auckland. Her centre regularly visited areas that were local to them. Fran suggested that the community influenced the centre's choices with the use of digital technology because, "there's more digital technology used outside the centre, I think it is kind of like forcing us to use more in the centre". When asked about video conferencing, Fran said she had had no experience with it and did not know much about it. She stated that she refused to use it and explained, "I just don't like it, I like face to face. But I don't like the idea of someone looking at me through a screen and talking. It's just, I don't know why. I can't explain it. It's irrational". In terms of possible benefits and challenges of using video conferencing, Fran felt she did not know enough about it to comment. She did however say that it could have interesting potential as a means of communication with whānau, and that it could be difficult because of a lack of knowledge in teachers. She also expressed, "if people had a real passion for it and a real understanding of how it could benefit the whānau and children, I think it would make a big difference. Yeah but I think it's (a) lack of understanding".

5.8 Grace's perspective

When asked what her own experience with digital technology was, Grace listed the types of digital devices she had used, responding, "probably cell phones, computers, iPads. Yeah, just stuff like that really". Grace further explained that within her role as an early childhood teacher, she used computers for administrative tasks, as well as using iPads and iPhones with the children for YouTube songs and research. Grace felt that digital technology could be beneficial because children could have instant access to up to date information. She then described the challenges of digital technology being the impact of children not learning how to use books, particularly reference books. Grace explained, "Yeah, I suppose the reverse effect is that they don't know how to use reference books because they just type it in and it comes up and that's it, they don't have to, say, go to a library and look in the index or even use the computers at the library to find where to go". In her opinion of children's uses of digital technology in their home lives and the impact within the centre, Grace explained that children who were more familiar with digital technology understood

how to treat iPads and phones respectfully and gently, whereas she noticed the opposite for children who were less familiar, were less respectful and needed to be taught how to be gentle with the equipment. She also found that children who were familiar with digital technology from their use of it at home wanted to use it more than those who were less familiar, and that those who used it at home wanted to play games more. Grace expressed her opinion that at the centre digital technology was used for music and research, and was "not to be used for whatever games they're playing at home and stuff". While Grace felt the uses of digital technology were different in different settings, she also felt that having connections between the home and the centre was important and felt that it was positive when children shared their learning from one environment to another. Grace also felt that community connections were important, with the community's support of the centre playing a huge role in the centre itself. She described how an opinion of one person in the community could be spread, especially with the use of community Facebook pages, and how that can have a huge impact on a centre. Grace also described how the centre used community Facebook pages to share what was going on in the centre, as well as having a private centre Facebook group for the families involved in the centre to share learning and information. In terms of video conferencing, Grace was not very familiar with it, having only used FaceTime a few times. She did say she could use it in the centre if it were needed. She expressed the idea that a benefit of using video conferencing was that "it's instant information. You can ask a question and get an answer straight away, or discuss it, and yeah, have that instant feedback". Some of the challenges Grace anticipated were around the time to do it (video conferencing), and the fact that the information communicated was not written down so was less accessible for revisiting. Grace worried that if using video conferencing in a centre to gain information, she would forget what the information was.

5.9 Hilda's perspective

Hilda described her personal skills with digital technology as, "Yep, (I'm) not a gamer, not a computer whiz, but I know how to get around a computer." She explained how, "as a child there was not much technology. As we get older there is more and more in our environment." Hilda also said that she had never been interested in the latest trends and had never felt the need to get the newest things. In her practice as a teacher, Hilda said that she mainly used digital technology for songs and on special occasions, for movies. She further explained that the age group she worked with was the two to three year olds and her experience was that when movies were played, children lost interest after a short time. Hilda felt that, "our world is becoming a digital world" and because of that, children needed to be given at least basic skills with the uses of digital technology. She believed that there are a lot of digital occupations around now so children needed to be introduced to the basic skills so they could build on those skills later in their lives. Hilda also gave her reason

for believing children needed to be introduced to digital technology young, explaining, "something I heard recently is that…we're preparing children for occupations that don't exist yet. So if we're getting them ready for things that they are going to discover or whatever then we need to make sure that they have all the facts up to that point". Hilda saw the benefits of using digital technology with young children as building foundations for their future world. The concerns Hilda expressed in regard to digital technology was that children might sit for long periods of time staring at screens and not really interacting, including when they were playing video games. She called this, the "mind numbing side of technology" and expressed her opinion that there was a very fine line between what was good use of digital technology for children and what was having a negative impact. When asked about what the role of the community was in terms of early childhood education, she was very unsure how to respond, although she did express her view that the wider community was important and felt that "it takes a community to raise a child". She pinpointed the centre's links with the wider community, describing regular visits to various locations in the immediate community and how valuable that was for learning rules of safety such as road safety. Hilda felt that connections between the home lives of the children and the centre environment were important and explained that the centre tried to take aspects of the children's home environments and include those in the centre to create a sense of belonging. In relation to digital technology, Hilda felt that the centre contributed to children's experiences by providing different types of experiences using digital technology than children may get at home. She felt that children may use digital technology more at home and may have easier access to it. Hilda felt that digital technology may have a negative impact on young children if they were exposed to concepts that they were not ready to explore yet, and that it may give children a distorted view of reality. When asked about her experience with video conferencing, Hilda said she was familiar with it, and used it sometimes, but she preferred the telephone. Hilda said, "but, video chatting I think, it's got its perks and its bonuses, but I've never really gotten too excited about it". She did say that she would use video conferencing in a centre with children if it had a purpose and if it was practical. She felt it could offer access to more areas of the world without the need or complications of travel, and that it could allow for topics to be explored in ways may not have been possible before. However, she also felt that the toddler age group particularly may not understand that video conferencing is a conversation and they may instead treat it as a television programme. She felt that children may not have the conversational skills to interact via video conferencing. Hilda also felt that people may be too busy to take part and that differences in time zones could pose a practical problem. Furthermore, Hilda was concerned about how teachers would ensure the appropriateness of the person children were engaging with during an interaction, and worried that there may be disappointment if any information sought was not gained during the interaction.

5.10 Irene's perspective

Irene said she used digital technology a lot, as did her own children. She said that within the centre where she worked, digital technology was mainly used for researching topics that children were interested in, as well as using YouTube for phonics and numbers. Irene said that the way digital technology was used was very repetitive so it was like rote learning of information. She saw another benefit of digital technology, explaining "it's also visual for the children who may need the visual learning as well". In addition, Irene felt that children were going to be learning with digital technology when they went to school so they might as well learn to use it in early childhood. Part of the importance of using digital technology with children in early childhood settings, in Irene's opinion, was that "some of them may not have it at home, so it is quite important I feel, that they are introduced to it". Irene believed that some of the negative implications of young children using digital technology was that they may become too reliant on it, they may not learn to use books which may decrease their literacy, and that children may use their imagination less as they did not need to think up their own answers because of the speed of information available from the internet. Irene said that the community had a huge impact on early childhood education and discussed many ways that the centre created links with the community in which they were placed. Some of the ways included children in the centre being involved in activities sourced from the community while at the centre, such as swimming and dance, excursions to local areas regularly, and excursions to the wider Auckland region occasionally. Irene also acknowledged the links made through children sharing what they learned outside of the centre with their peers at the centre, and families building relationships amongst each other. In terms of the differences between children using digital technology outside of the centre and using it within the centre and the possible implications, Irene said digital technology was used for "playing games, and maybe using it for leisure rather than learning, whereas the games that we would use in the centre would be educational, so (we use it for) teaching them sounds of letters, the phonics games, and numbers". Irene described the way children, in her opinion, were using war games at home and using that knowledge in the playground, and that the centre only allowed educational games. When asked about the importance of practising what they learned in one environment in another, Irene said that she believed it was important to do this. She felt that for children to build up their skills, they needed to be practising them in a range of places. Irene was familiar with video conferencing and she and her family used it often in what she described as a social way. Irene also added, "my daughter is on Skype all the time with her friends, umm, cousins. I actually made a comment to my husband the other night, I was like they won't even need to have parties, they will just be able to sit at home" Irene also described how she had used video conferencing in her practice as a teacher so the children could communicate with another teacher who had moved away. She explained that she would use video conferencing in

early childhood education, but she did not know how to implement it. She felt there was not enough knowledge for teachers to understand how or why to use it. She expanded on that, saying that the centre where she worked had the resources, but no one had taken an interest in using them, and said teachers would need the knowledge to be able to use them, and some would need knowledge of how to use computers in general. Irene felt that video conferencing had the potential to allow children to experience other countries and see other classrooms without the need to travel. However, Irene did have some concerns around video conferencing. She worried that there may be privacy concerns and was worried that the children may be exposed to inappropriate material. Irene said, "there has to be some kind of boundaries and limitations and safe web browsing and things like that. They all play a role in letting children have access to the internet, and that whole range of people they can talk to and things like that."

5.11 Emerging themes

When reviewing the data given by each individual, a number of themes, or common topics, emerged. The first theme that became evident when reading through the transcripts was that many of the participating teachers felt that they were not experts with computers. They described this in various ways, and notably, a few teachers compared themselves to others in their family, including to their own children. Added to this theme of lacking expertise, some teachers described a lack of knowledge of digital technology for themselves or others as a challenge in implementing digital technology and video conferencing. Another theme that came through strongly was the lack of confidence teachers felt in themselves and in their abilities to either use digital technology with children, to appear on a screen, or even to have their centre and teaching practice viewed by others. Digital technology as the way of the future was another theme that emerged. This was repeated in various ways during a few interviews. Teachers felt children needed to learn about digital technology because it was the way the world is heading and these skills would be relevant to them in the future. One participant described how parties may even take place as interactions through video conferencing one day as she saw children in her own life communicating that way. The definition of the types of activities digital technology was used for was a strong theme, with multiple teachers expressing that centres only used digital technology for educational purposes, and then describing those educational purposes as phonics and letter recognition. Teachers explained that children use digital technology more for games at home. A theme emerged around community, where teachers generally felt that ties with the community were important, but some found it difficult to describe why. Along with this, teachers felt children need to practise a range of skills in a range of settings, yet comments were made that the games played at home were not suitable for playing at the centres. Another theme that emerged was that of safety and keeping children safe

online. This related to content in advertisements, content children could click on, and the appropriateness of people they communicated with during video conferencing interactions. The theme of easy of learning with instant and up to date information was also apparent, as it was mentioned by a few participants. Alongside that was the concern that children would miss out on some aspects of learning, and that children had learnt well previously so 'why change?'. These themes are discussed in more detail in the next chapter, and their relationship to literature discussed as well.

5.12 Conclusion

In the interviews, participating teachers were able to express their own points of view as well as help to build a bigger view of what some key understandings and beliefs for teachers may be. Some of the views echoed those of other participants, leading to strong themes emerging, and some were views that were only held by one individual. All of the information is relevant, as it builds a greater understanding of what is important and relevant for teachers in the early childhood sector. Through these interviews it became apparent that some of the participating teachers enjoyed aspects of digital technology and some struggled with it. It became clear that video conferencing is something that not many teachers participating in this research project had had experience with personally, and even fewer had experienced it within centres. Through these interviews, it became apparent that the use of digital technology in centres was viewed through an educational lens, with teachers discussing how they would only use digital technology and video conferencing if there were a clear reason as to the educational benefits for children.

Chapter 6: What does it mean?

6.1 Introduction

What does this research data suggest about teachers' perspectives on video conferencing in early childhood education? This chapter outlines the key themes that emerged from the data gathered. Each theme that was identified is explored in relation to what was found when analysing the information participating teachers shared, how it relates to the readings and research that was reviewed, and what it all means in terms of the research question. The limitations of this research are explained in this chapter, with consideration given to the scope of size and area in which it was conducted, among other limitations. There are recommendations given, which include how this research could be used in practice and as a tool for the future.

6.2 Digital expertise

The first question asked of participants was for them to explain their experiences with digital technology. Therefore, the fact that they did so was not surprising, nor was it an anticipated theme for discussion as it was seen as more of a design to help the conversation begin and help the participating teachers feel at ease. However, when analysing the data, it became clear that similar terminology and ideas were shared by a few of the participants. That was, that they were not experts with digital technology. Most said they had limited knowledge of digital technology, with two seeming to feel it was important to point out that they were not experts. This lack of expertise, or a lack of feeling that they had the necessary knowledge around digital technology, is something that has been discussed in previous literature. In chapter 2 section 9, the work of authors such as Kesi (2014), Edyburn and Lartz (1986), and Chen and Chang (2006) all suggested that teachers do not feel their training contains enough information around digital technology for them to feel well prepared for the topic. In terms of the research question of teachers' perspectives of video conferencing in early childhood, it does lead to a doubt that some teachers would be able to determine their ideas on the topic if they feel they are lacking skills in digital technology as skills with digital technology are required to use video conferencing. Video conferencing is a form of digital technology so if teachers lack skills in digital technology in general, it is possible that they will not have the skills to entertain the idea of video conferencing themselves, let alone using it with young children. It could also mean that should video conferencing be implemented in their centres, they would not feel confident or capable in doing part of their job in implementing the centre's practice.

6.3 Teacher confidence

A theme that became apparent as the data from participants were analysed, was that many of the participating teachers seemed to lack confidence in themselves. This came across in a number of

things the teachers said, from one teacher who was worried video conferencing would lead to other teachers being critical of her practice, to two teachers feeling uncomfortable being on camera, for reasons they could not define more than to say it made them feel uncomfortable or silly. There were also five teachers who were not confident in their abilities to use digital technology in general. A teacher's lack of confidence in this way is not something I found in the literature reviewed. However, there were similar issues discussed, such as those outlined in chapter 2 section 9, with regard to teachers being seen as incapable of initiating the change they are being expected to make within their profession (see for example, Preston, 2001, and Gibbons, 2008). Whatever the reason for the teachers participating in this study to lack confidence in themselves or their use of digital technology or video conferencing, it is something that would need to be considered in self-reflections for the teachers themselves, and in centres' self-reviews. In terms of video conferencing, if teachers lack confidence in themselves or in their abilities to use video conferencing, this would make the video conferencing experience not only difficult, but also possibly uncomfortable for the teachers themselves. This lack of confidence in themselves could also have an effect on the children, as the literature reviewed in the first two chapters suggested children learn from those around them (see for example, Crain, 2000; McPake & Plowman, 2010). Children may learn through their observation of their teachers, that video conferencing is something to feel nervous about, or that seeing yourself on camera is just cause for discomfort. If this were the case, there is a chance that video conferencing could become a negative factor in children's education. This would mean that either video conferencing was left out of the centre, or that those teachers who lack confidence were given extra support and guidance to feel more confident in themselves and in their abilities.

6.4 Preparing for their future

For five of the participating teachers, their acceptance of digital technology in education is due to their view that it is the way of the future. Those five participants felt that the future world children will live in will require knowledge of digital technology. This is consistent with the literature that was reviewed for this research project. The idea that digital technology is going to continue to be a part of children's lives into adulthood is discussed throughout chapters 1 and 2. However, there are many authors who further this by discussing the idea that it is not the individual tools themselves that are important for children to learn to operate, but rather, it is the thought processes behind their use. Indeed, the Ministry of Education put forward in 2015 and 2017 the expectations that children are to be encouraged to become innovative and creative thinkers, who can reflect and analyse critically. This suggests that while these participating teachers recognised the idea that digital technology will be a big part of young children's futures, they did not express the idea that learning

about current digital technology is only a small part of what is needed to prepare students for their future. In fact, what the data reveals is quite the opposite. These participating teachers felt that by exposing children to current digital technology they were preparing children for a digitally literate future. This may suggest a deeper lack of understanding around what current knowledge and ideals are for preparing young children for their future. In relation to the question relating to teachers' perspectives of video conferencing in early childhood education, perhaps teachers are more inclined to think about the immediate digital aspect of the video conferencing process and interactions, rather than some of the deeper aspects, such as the skills of questioning what others say, and seeking additional information from a range of sources.

6.5 It's for educational purposes

During the interviews with participating teachers, questions were asked around what their experiences were with digital technology in their centres and around the links between children's home and centre environments. Analysis revealed that four teachers felt that digital technology was for educational purposes only within the centres. Those educational purposes included phonics, number and letter recognition, researching topics of interest to the children, and accessing songs from YouTube. Additionally, two teachers compared the use of digital technology in children's different environments by explaining that while the digital technology was only used for educational purposes in centres, it was used more for games and whatever children wanted at home. This type of thinking relates to some of the research that was reviewed in chapter 2. Teachers need to ensure they are offering children activities that they believe are best for the goals of the children and that fit with the centre's and individual teacher's beliefs (chapter 2, section 2). While this research did not ask for participating teachers to explain their views, understandings, or practices, it still revealed a commonly held belief of what education was for the two centres included in the research. The clear distinction between what happens in a centre being educational and different to what is used at home, however, shows that these participating teachers felt that games had no value, and that skills learnt in some recreational activities had no relationship to education. This is in contrast to the understanding that knowledge is learnt in many different ways and can be shared between contexts. It also suggests a lack of understanding around the idea that critical reflection can be applied to many different activities and that even some games may hold value. The value of a game may be that it is the family's culture to play those games together, or that children experience various content within their communities, or even that children may be part of online communities through game playing.

The way participating teachers separated the uses for digital technology, and almost dismissed the value of what else children may be learning while using digital technology in their homes and

communities, suggested that they were not giving thought to the idea that society is changing and along with it, children's activities are changing. This is discussed in chapter 1, particularly in section 4 where the literature suggested that changes in the world creates changes in social and individual norms and changes in the way people experience the world. The understanding of the teachers that digital technology was for educational purposes only creates a question around video conferencing and means they would possibly only use it if they could explain the educational benefits. While there may be educational benefits to video conferencing, it would be determined by the participating teachers and their centres as to whether they found those educational benefits to be worthwhile in their centres. This would most likely need a review by the individuals and their centres.

6.6 Community networks

The teachers participating in this research project general expressed the idea that community is important, though many could not articulate why. Some described the ways in which their centre made physical connections with the community, such as going for walks and visiting local places, while two said community was important but could not think of ways their centres connected with their community. One participant had no idea how to respond to these questions. Throughout the literature review for this project, community building and the importance of responding to community came through quite strongly. *Te Whāriki* (Ministry of Education, 2017a) makes reference to community throughout the entire curriculum document, with family and community being one of the four principles that make the foundations of the early childhood curriculum in New Zealand. This means that teachers in New Zealand centres should be familiar with what family and community connections mean and how it applies to their centres. It may be that the participating teachers were unsure of the link between community and digital technology, or that they had not given these links much reflection recently, or even that the community networks were not very strong. For whatever reason, the teachers interviewed for this research project generally found the topic on community connections rather difficult to articulate into words. The effect this could have on video conferencing in early childhood would depend on the reasons for the participating teachers not being able to define community networks. If the participating teachers did not value the links between communities and early childhood centres, then building relationships through the use of video conferencing would not interest them, and they would possibly not even consider it as an option. If they did have an interest but were just unsure how to answer, then they may be more likely to use video conferencing to extend children's learning through online interactions with community members, or individuals further away.

In chapter 3, section 2, the relationships between video conferencing and community networks are described. As video conferencing is a means of communication, it can allow for the forming, building, and maintaining of relationships with others. For teachers who believe in the importance of communities, video conferencing may hold a possibility for stronger community ties, both locally and globally. As described in chapter 1, section 6, there is a growing understanding that communities are becoming larger with the use of the internet, with online communities and communications allowing for global networks and communities to develop and grow. Video conferencing can be a means of building and strengthening such online and global communities. There are also communities of learners (see chapter 2) where centres have the possibility to build learning communities with other schools, teachers have possibilities to support each other via online communities, and specialists have the ability to build closer communities with the centres they are supporting, all possible with the use of online communication, which can include video conferencing.

6.7 Children's safety

The theme of the safety of children emerged. Two participants felt pop up advertisements may be a concern as the teachers could not control when those advertisements popped had up or what content they may have. Two participants were concerned about what else the children might see or hear that was not appropriate. One participant was concerned about the appropriateness of the person the centre was video conferencing with. These are legitimate concerns, all of which were discussed in chapter 2, section 8 where the review of literature showed similar concerns to those of authors such as Grey (2011) and Wang, Kinzie, McGuire, & Pan (2009). One of the ways to address these concerns is to ensure close supervision and to ensure the people children are video conferencing with are known to be safe people. In terms of video conferencing, these concerns may be enough to put teachers off using video conferencing in early childhood education, or at the very least, these are concerns to discuss when reviewing the individual teachers' stance on using video conferencing, and digital technology in general.

6.8 Ease of learning

A theme that became apparent when analysing the data was that the internet was thought to provide ease of learning. Four participating teachers brought up the idea that with the internet, children had quick and easy access to up to date information. This was seen as both a positive and a negative feature. According to participants, this was positive because children and teachers could get information while the interest for something was there, as well as getting more up to date and relevant information than may be found in books. In the view of the participants, this ease of access to information was negative because children may not have learnt the skills associated with using

books, children may not have used their imagination and creative thinking to answer questions, and there may have been less chance for literacy opportunities.

Ease of learning through the use of digital technology and the internet is a topic that was also found during the literature review (see chapters 1 and 2). This theme relates to teachers' perspectives of video conferencing because video conferencing is a different way to gain access to information instantly via the internet. Children using video conferencing may have the possibility to have their questions answered straight away due to having a conversation with someone who can answer their questions. This does however take a bit more planning to pre-plan some questions and conversation starters, as young children may be still learning the necessary communication skills (see chapter 3, section 4). One participant also expressed her opinion that children had learnt well before so there was no need to change anything. This is an opinion that suggests perhaps a concern or maybe even a fear of change, which is discussed in both chapter 1 and chapter 2 as a natural reaction by some whenever a change occurs to the world and the way things are done. This person, or any other teacher with a similar belief that children had learnt well prior to the internet and digital technology being available, would be less likely to include video conferencing in their practice due to their belief that it was not necessary for learning.

6.9 Video conferencing, maybe

This theme came about because of the questions asked, although some teachers talked about it during their answers to other questions. Six of the nine teachers felt they would use video conferencing in their teaching if they found a reason for it or if they had more understanding of how to use it. This is something that relates to what is discussed in chapter 2, where teachers should be evaluating everything before it is either added to the centre's practice or not used because a thorough review and reflection had deemed it unnecessary, unhelpful, or not a good fit for the centre's practice. The views of these teachers who, during their participation in this project, suggested that they may consider video conferencing if they found a need for it, suggests that teachers are open to different ideas and possibilities offered by aspects of digital technology.

6.10 Limitations

There are a number of limitations to keep in mind in relation to this research. The first is that the two participating centres were in small rural areas not far from each other. This could mean that the views expressed by participants were similar due to the close proximity of the areas and the fact that both were similar areas. Another limitation is the fact that teacher training levels and experience were not recorded by the researcher. While this was done intentionally, as the goal of this research was to find out about the perspectives of all who are teaching young children in early childhood

centres, it may be a limitation in that no comment can be made as to whether qualified teachers hold differing beliefs to unqualified teachers. Another limitation was the lack of time given for each interview. While valuable data were gathered during each interview, as interviews were conducted during centre operating hours, it was important to ensure teachers were not away from their responsibilities for long. This meant there was not as much time to ask additional questions when teachers gave responses, to gain a deeper understanding of what they were saying or to encourage further information sharing. These limitations do not reduce the value of what has been found during this research project, but merely mean this research can be enhanced with additional research in the future.

6.11 Recommendations

I would recommend that from this research, more research is conducted. Additional information, and a greater scope of teachers participating in a similar project are one possibility. There are many areas that this research has shown could be researched further to add to the understanding of video conferencing and community. I would also recommend that centres review their practices; their individual beliefs, as well as centre wide philosophies and practices. This would ensure centres are making informed decisions that reflect their beliefs. While centre beliefs may differ from what is practised in the community, with a review, teachers would have a strong understanding of what their centre's practice and philosophy is, which would mean families who are a part of the centre are clear on those as well.

6.12 Conclusion

The world is a changing place, and as with any time in history when new ideas and technology are introduced, societies are changing along with it. Children today are growing up with much easier access to information and a greater capacity to be involved in communities both within their immediate community, as well as further afield, including globally. This brings about challenges, such as increased risk of inappropriate content for young children, concerns around the people who can build relationships with young children, and the amount of time children are spending using the digital technology which is readily available to them. It also brings about positive aspects, such as ease of access to up to date information, ease of communication with others, and a greater ability to build and maintain relationships over large distances.

Video conferencing is a tool that is being used by some professionals to share professional knowledge and support, as well as by families to maintain contact with loved ones. It has the potential to allow for children to communicate with people they may not have had a chance to talk

to otherwise, to maintain a relationship with people who are inaccessible otherwise, and to build a wider community network, including the possibility of building networks globally.

Video conferencing is something that is increasing in popularity among families, with even some of the participating teachers' families using it to keep in touch with friends and family. However, while it is growing in its use outside of early childhood centres, in the two centres where these participating teachers work, video conferencing is not something that is being considered within their practice. It has not been reviewed or thought of very much at all. While some teachers could see some value in it, and many said they would use it if they could see a need, but it was not something many had thought very much about. This is an area that would need some review and reflection on, if it were to be considered as a possibility for use by the participating teachers.

Video conferencing is more than just a means of communication. As communication and interaction are valued and recognised ways to share information, for children to learn social and cultural norms, and to build a strong sense of self and belonging, the fact that video conferencing allows for those having a conversation to see each other, adds to the communication being used. Some facial expressions and gestures will be seen by those on the other side of the screen, allowing for deeper meanings and understandings to be portrayed.

This research project obtained its goal of discovering what the perspectives of early childhood teacher have on video conferencing. While it is limited, it allows for some understanding of the perspectives of some teachers who are teaching young children in New Zealand today.

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Appendices

Appendix 1: Ethical approval

7 March 2016

Andrew Gibbons
Faculty of Culture and Society

Dear Andrew

Ethics Application: **16/55 Video conferencing in ECE: Teachers' perspectives.**

Thank you for submitting your application for ethical review. I am pleased to confirm that the Auckland University of Technology Ethics Committee (AUTEC) has approved your ethics application for three years until 1 March 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/researchethics. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 1 March 2019;

- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/researchethics. This report is to be submitted either when the approval expires on 1 March 2019 or on completion of the project;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this.

To enable us to provide you with efficient service, we ask that you use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.

All the very best with your research,

Kate O'Connor
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Desire Purnell deways.dj@gmail.com

Appendix 2: Participant information sheet

Participant Information Sheet

Date Information Sheet Produced:

2nd February 2016

Project Title

Video conferencing in ECE: Teachers' perspectives

An Invitation

Kia ora. My name is Desiré Purnell and I am currently studying with AUT towards a Master of Education qualification. I am a fully qualified and registered early childhood teacher, and have 12 years of experience working in centres. The research I am conducting is a part of the requirements I need to fulfil towards my qualification, as well as being a topic I am very interested in.

I would like to invite you to be a part of this research by contributing your time, knowledge, and ideas during an interview. Your participation is voluntary and you may change your mind at any time up until you have reviewed the information you have given and agreed it is correct and can be used. Your identity and the identity of the centre will remain confidential.

What is the purpose of this research?

Digital technology is becoming more and more a part of everyday life and is present in many areas of a child's world. I noticed during my practice as a teacher that it was not a topic that was being given much time or thought and I want to understand why that could be and how digital technology, particularly video conferencing, is viewed within the profession. I am particularly interested in teacher views on video conferencing as a potential tool for opening up access to the global community.

How was I identified and why am I being invited to participate in this research?

To find out more about digital technology in early childhood education, 5 centres in the Franklin area were contacted with the opportunity to participate in this research. The first 3 centres to respond will be participating, of which your centre is one. The research calls for between 9 and 15 participants, with the first to respond to this letter being selected. There will be no specific requirements to being a participant.

What will happen in this research?

During this research you will be interviewed in either a suitable room in your centre or at AUT South Campus depending upon your preference. You will be asked some predetermined questions, but will have the opportunity to express any other ideas and thoughts you have that you believe to be relevant to the topic. Once the interview is completed I will transcribe the interview and will then ask you to review it in your own time to ensure you are happy that I understood you correctly. This processes will take 2 weeks from the time of the interview. I will then use this information for my project, and will let you know the results of the project at the end of the year.

What are the discomforts and risks?

The main discomfort will be the need to reflect on your own practice, views, and believes on this topic.

How will these discomforts and risks be alleviated?

You will have the ability to opt out at any time and you will be able to tell me if you are uncomfortable with any part of the interview and the interview will be stopped.

What are the benefits?

Through this research, I will benefit personally as I will be furthering my own knowledge and learning as well as gaining a qualification. You and your centre will benefit as it will allow you to consider some ideas more carefully and to gain further information. The wider early childhood community will benefit as this research will provide added information and create opportunities for further research. There is a possibility that this research will be used for educational publications, such as a journal article, in the future.

How will my privacy be protected?

Your name and identifying details, along with the name and identifying details of the centre, will remain confidential. If you choose to be interviewed at your centre then people may be aware of your involvement however all of your comments will be carefully presented in order to limit the possibility that you will be identified.

What are the costs of participating in this research?

The only cost to you will be approximately 1.5 hours. That consists of 1 hour for the interview and half an hour to review the transcribed information.

What opportunity do I have to consider this invitation?

You will have one week from today.

How do I agree to participate in this research?

If you would like to be a part of this research, you will need to contact me via email. Then an interview time will be set up. The consent form you have been given will need to be signed before any interview can take place. The consent form can be given to the researcher at the beginning of the interview time.

Will I receive feedback on the results of this research?

Yes you will. This will happen through email and during a staff meeting.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Andrew Gibbons*.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, *ethics@aut.ac.nz* , 921 9999 ext. 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:

Desire Purnell

deways.dj@gmail.com

Project Supervisor Contact Details:

Andrew Gibbons

andrew.gibbons@aut.ac.nz

Appendix 3: Consent form

Consent Form

Project title: Video conferencing in ECE: Teachers' perspectives

Project Supervisor: Andrew Gibbons

Researcher: Desiré Purnell

○   I have read and understood the information provided about this research project in the Information Sheet dated 2nd February 2016.

○   I have had an opportunity to ask questions and to have them answered.

○   I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.

○   I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.

○   If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.

○   I agree to take part in this research.

○   I wish to receive a copy of the report from the research (please tick one): Yes○   No○

Participant's signature: ....…………………………………………………

Participant's name: ....…………………………………………………

Participant's Contact Details (if appropriate):

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……………………………………………………………………………………..

Date:

Approved by the Auckland University of Technology Ethics Committee on** 07/03/16 **AUTEC Reference number 16/55.

Note: The Participant should retain a copy of this for

Appendix 4: Indicative questions

Date: Start time: End time:

Researcher: Desiré Purnell   Participant:

Research title: Video conferencing in ECE: Teachers' perspectives

Indicative Questions for Research Participants

1) What is your experience with digital technology?

2) What digital technologies do you currently use in your practise and how?

3) What benefits, if any, can you see for children's learning by using digital technology in early childhood education?

4) What challenges, if any, can you see for children's learning by using digital technology in early childhood education?

5) What role do you believe the wider community plays in early childhood education?

6) How do you currently connect with and involve the wider community within your practice?

7) How do you think children's experiences of digital technology outside the centre could impact the use of digital technology within the centre?

8) How important do you think it is for children to have the opportunity and tools to practice what they learn from one environment within another environment? Why/why not?

9) How have you or how do you use video conferencing, such as Skype, in your life?

10) Would you use video conferencing in your implementation of the early childhood curriculum? Why/why not?

11) What benefits do you think video conferencing could offer in early childhood education?

12) What challenges do you think video conferencing could create in early childhood education?