PARENT EXPERIENCES OF CHILDREN USING DIGITAL TECHNOLOGY FOR LEARNING AT HOME

by

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PARENT EXPERIENCES OF CHILDREN USING DIGITAL TECHNOLOGY FOR LEARNING AT HOME

ANDREA VAN JAARSVELD

2017

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CLEARANCE CERTIFICATE	CLEARANCE NUMBER: **EC 17/02/01**
DEGREE AND PROJECT	MEd Parent experiences of children using digital technology for learning at home
INVESTIGATOR	Ms Andrea van Jaarsvelsd
DEPARTMENT	Early Childhood Education
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CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

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Ms Bronwynne Swarts
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- Compliance with approved research protocol,
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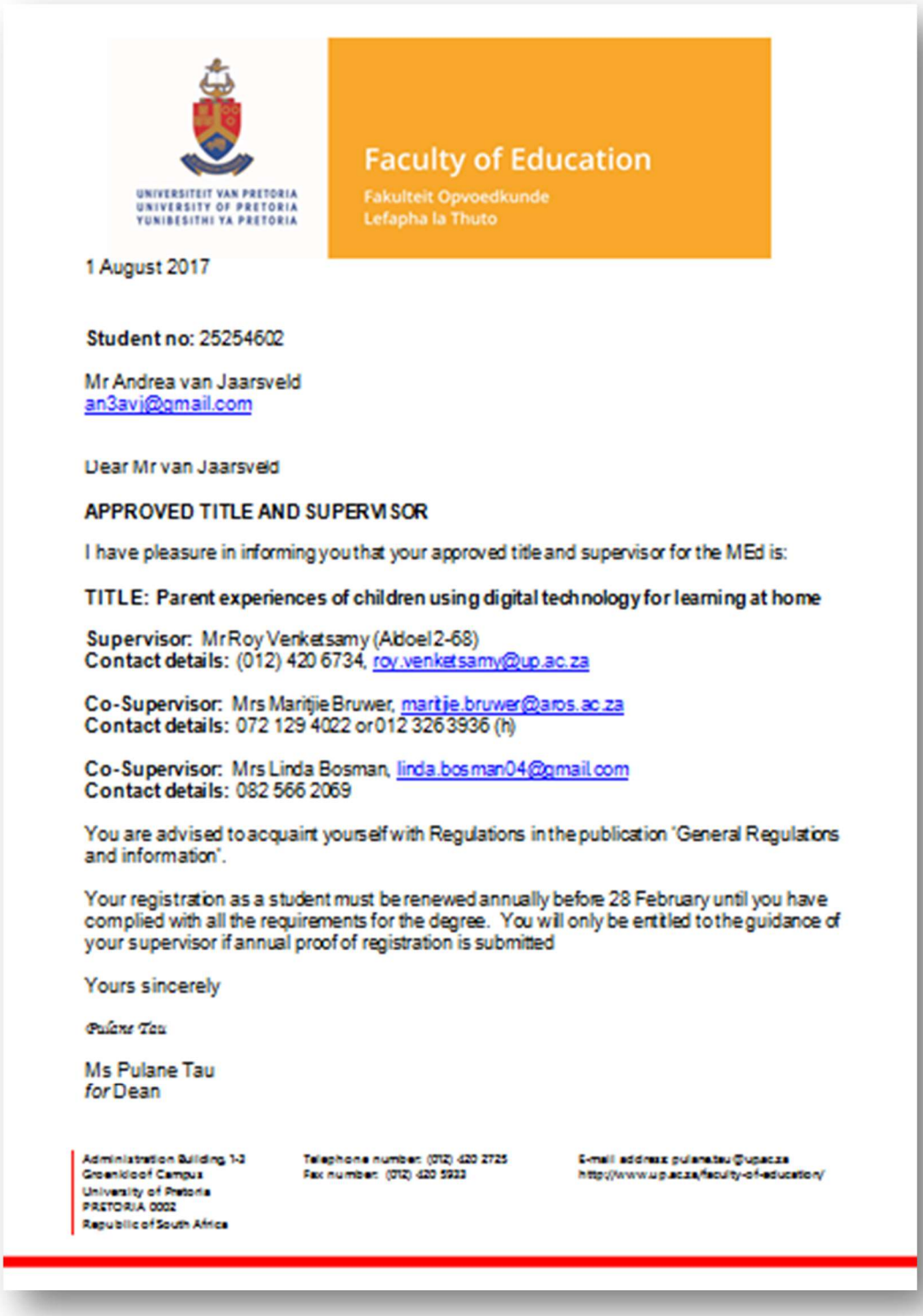

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1 August 2017

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Dear Mr van Jaarsveld

APPROVED TITLE AND SUPERVISOR

I have pleasure in informing you that your approved title and supervisor for the MEd is:

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You are advised to acquaint yourself with Regulations in the publication 'General Regulations and information'.

Your registration as a student must be renewed annually before 28 February until you have complied with all the requirements for the degree. You will only be entitled to the guidance of your supervisor if annual proof of registration is submitted

Yours sincerely

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THIS STUDY IS DEDICATED …

To my wonderful husband and precious daughter, you are my inspiration.

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Lastly to my dad, without you none of this would have been possible. Thank you for your unconditional love and support. You are a wonderful parent and a great inspiration.

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ABSTRACT

Digital technology is changing rapidly and so is the increased use of interactive screen media such as smartphones and tablets by young children from all income groups. Research concerning young children and the use of digital technologies has lagged considerably behind the rate of technological advancement. Furthermore, gaps in the literature point to a need to understand parental awareness of, and engagement with, the technology that is increasingly available to young children in South Africa.

My study focused on how parents experience the use of digital technology by young children at home within the South African context. The purpose of this study was to investigate and establish a basis for understanding how parents experience young children using digital technology for learning at home. I conducted a quantitative study making use of an online survey designed and created using Survey Monkey. The online survey included parents in South Africa and was distributed through various social media platforms, such as Facebook, Twitter, LinkedIn and Pinterest. My sample size was less than 40% of the South African population. The theory of Social Construction of childhood in conjunction with the concept of Prolepsis was used as the theoretical framework. The results of the online survey were analysed and the findings indicate that:

The majority of the children younger than 8 years interacted with digital technologies such as smart phones in their homes with the support of their parents. The age of parents does not seem to have an influence on young children's use of digital technology, but rather the level at which parents themselves feel comfortable using technology. More than 90% of parents limit the amount of time their children are allowed to spend using digital technology. The majority of parents believe that technology can be beneficial rather than harmful for their child's education and development. Most parents also believe that a child should be between the ages of 2 and 3 before they start using a digital device.

As a result of my study, educators and policy makers might understand why parents have certain reservations regarding their children's use of technology and at what age parents believe technology can be integrated in education in a responsible manner. Further research should be done regarding young children and the use of digital technology to determine the influence thereof on education. Findings from this study might encourage parents, policy makers and other relevant stakeholder to bring about meaningful changes to the introduction of digital technologies in education development centres.

Keywords:

Young children, Digital technology, Mobile devices, Child development,

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ACRONYMS

3D	3-dimensional
DGBL	Digital Game-Based Learning
TV	Television
ZPD	Zone of Proximal Development

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CHAPTER 1 BACKGROUND AND ORIENTATION

1.1 INTRODUCTION

Digital technology is changing rapidly and so is the increased use of interactive screen media such as smartphones and tablets by young children from all income groups (Rideout & Katz, 2016). One can therefore assert that technology is playing an increasing role in the education of young children (Daugherty, Dossani, Johnson, Erin and Wright, 2014). George (2014), Cocozza (2014) and O'Conner and Fotakopoulou (2016) suggest that ample research has been done on young children and the use of technology. However, little research was done on the parents' experiences of the use of digital technology and its educational impact on young children. Touchscreen technology is becoming incorporated in young children's everyday lives, raising questions about the level of incorporation that should be allowed and whether it should be incorporated at all (Cocozza, 2014). George (2014) agrees and states that careful attention needs to be given to the issue of incorporation of technology where children in early childhood are concerned, due to the fact that tablets and touchscreens are becoming more affordable and easily available. Moreover, within the South African context there is a lack of investigative research on parents' experiences of young children using digital technology for learning at home.

The research done investigated and reported on the findings of an online survey of South African parents' experiences of young children using digital technology for learning at home. Emphasis was placed on the possible advantages and disadvantages as perceived by the parents, and was accentuated by a literature review pertaining to the latter. Parents' personal experience with technology were taken into account, as well as their experiences while their young children made use of digital technology. The research was quantitative with an online survey, designed and created using Survey Monkey. Survey Monkey is one of the world's leading providers of web-based survey solutions (Survey Monkey, 2009). The online survey

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included parents in South Africa and was distributed through the use of various social media platforms, such as Facebook, Twitter, LinkedIn and Pinterest.

1.2 RATIONALE OF THE STUDY

Technology is advancing at a very fast pace, influencing people from all nationalities, traditions, gender, ethnicity, class and importantly age (Deragon, 2011). Consequently, children are being introduced to technological advancements from a very early age. This has resulted in various changes such as children becoming savvier with the use of technology, whilst the education environment is speedily gaining momentum towards introducing technology in schools to promote teaching and learning (The National Association for the Education of Young Children, 2012). The rapid change in technology and its increasing presence in the daily lives of children served as the motivation to investigate parents' experiences of young children using digital technology for learning at home in a South African context.

In addition to being a professionally qualified Foundation Phase teacher, I am a great advocate for the use of technology in education. As a teacher who believes that technology should play a vital role in education, especially from a young age, I have dealt with many parents with contradicting views regarding young children's use of technology. According to Radesky, Schumacher and Zucherman (2015), technology is constantly changing and I believe that some parents do not understand technology and this ignorance leads them to believe it is 'bad' for their children. Parents may well be more open to the use of technology from a young age if they find technology easy to use.

When implementing technology in education from a young age, I believe it is essential to understand the experiences of parents regarding their children and their use of technology. Research regarding children in early childhood and their use of technology has lagged behind considerably, in relation to the rate of technology adoption (Radesky *et al.*, 2015). Epstein (2013) agrees and states that research has a hard time keeping up with the latest digital inventions, thus previous research might be seen as outdated. O'Connor *et al*. (2015) suggest

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that previous research shows conflicting views. Two dominant discourses are evident; some research shows that parents still have overly negative feelings regarding their young children and the use of technology, whereas other research indicates that parents are becoming aware of the importance of technology usage by their young children and the positive impact that it could have on their lives (O'Connor *et al*., 2015). I investigated the trend regarding these discourses in the South African context. Furthermore, gaps in the literature point to a need to understand parental awareness and engagement with regards to the technology that is increasingly available to children in early childhood (Vittrup, Snider, Rose & Rippy, 2016).

1.3 PROBLEM STATEMENT

Parents are often unsure about the role that technology should play in their young children's lives. According to O'Conner *et al*. (2016), parents can be seen as the main gatekeepers of their children's use of technology. Robinson (2013) believes that parents tend to act according to their definition of being a 'good parent', therefore parents' experiences play a key role in young children's usage of mobile technology.

The need for this study emerged from the lack of research concerning parents' experiences of young children using digital technology for learning at home. This study attempted to answer the following questions:

1.3.1 Primary research question

How do parents experience the use of digital technology by their young children at home?

1.3.2 Secondary research questions

In order to fully explore the primary research question, the following secondary questions needed to be addressed:

1.) What do parents view as an appropriate age for their children to start using digital technology?

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2.) How do young children use digital technology?

3.) What are the educational advantages and disadvantages of young children using digital technology?

4.) What are parents feelings regarding their own responsibility and that of the technology industry regarding the use of technology by young children?

5.) What impact does parents ages make on their children's use of digital technology?

1.4 PURPOSE OF THE STUDY

The purpose of this study was to investigate parents' experiences of young children using digital technology for learning at home. Parent's views and experiences of technology play a significant role in their understanding of the use of technology by young children (O'Conner *et al.,* 2016). According to O'Conner *et al*. (2016) and Nikken and Schols (2015), parents can be seen as the main gate keepers of their children's use of technology. Robinson (2013) believes that parents tend to act according to their definition of being a 'good parent', therefore parents' experiences play a key role in young children's usage of mobile technology.

1.4.1 Research aim

The aim of this research was to understand to what extent parents allow and facilitate their children's engagement with technology in the home, so that greater understanding of the potential use of technology from the perspective of parents can be ascertained.

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1.4.2 Research objectives

The research objectives were to provide information that may assist parents with the management, control and support of how their young children may use digital technology for learning.

1.5 RESEARCHER'S ASSUMPTIONS

The following are general assumptions that the researcher held about the proposed study:

- technology is available in homes;
- children have access to the technology;
- children can operate the technology to access applications;
- some applications may have great educational value;
- parents fulfil a gatekeeper role in controlling the access that children have to technology;
- parents' attitude towards the value of technology will determine the degree to which children could benefit from technology.

1.6 BENEFITS OF THE STUDY

This research is important, because it can help educators and policy makers understand why parents have certain reservations regarding technology and their children's use thereof, and at what age parents believe technology can be integrated in education in a responsible manner. Parents that are skeptical of technology may learn from the experiences of others and gain a better understanding of the role and value of technology. As a result, they may become more comfortable allowing their children to use digital technology for their educational benefit. Teachers can find a way to use technology on a level where the parents feel more comfortable. Additionally, educational mobile application developers can learn how to improve their products by taking parents' views and experiences into account.

1.7 CONCEPT CLARIFICATION

For this study of parents' experiences on the use of digital technology and its educational impact on young children, the following concepts are clarified to ensure consistency and understanding throughout the study.

1.7.1 Young children

For the purpose of this study, a young child is someone who is between the ages of 0-8. Both de Witt (2009) and UNICEF (2001) agree that children between the ages of 0-9 (early childhood) are in an important period for rapid development. The child goes through various developmental stages namely prenatal phase (birth to 2-4 weeks); infant (2-4 weeks to the end of the 1st year); toddler (2 to 5 years); the preschooler (5 to 6 years) and the school beginner (6 to 9 years) (de Witt, 2009). During this time, the brain undergoes remarkable changes that lay the foundation for further learning and development (United Nations Educational, Scientific and Cultural Organization, 2016).

1.7.2 Digital technology

Vittrup *et al*. (2016) define technology as the use of tools and methods to create and produce. The Victoria State Government (2015) defines digital technologies as being electronic tools, systems, devices and resources that generate, store or process data. New Zealand Commerce and Economics Teachers Association (2006) refer to the term digital technologies to describe the use of digital resources to "effectively find, analyze, create, communicate and use information in a digital context". This encompasses the use of tools such as web tools, digital media tools, programming tools and software applications such as …

The Victoria State Government (2015) gave the following as examples of digital technologies: social media, online games and applications, multimedia productivity applications cloud computing, interoperable systems and mobile devices. For the purpose of this study digital technologies will focus on mobile devices.

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1.7.3 Learning

Learning can be described as a change taking place in behaviour as a result of practice and experience (Huitt & Hummel, 2006). Kolb (2015) defines learning as a process whereby knowledge is created through the transformation of experience.

This study focuses more on informal learning rather than formal learning. Schugurensky (2000:1) defined informal learning as "learning that occurs outside the curriculum of formal and non-formal educational institutions and programs"; whereas formal learning is learning that takes place in a formal educational institution, where a formal curriculum is followed.

1.8 LITERATURE REVIEW: AN OVERVIEW

Children in early childhood are exposed to interactive screen media from a very young age due to the fact that technology is changing rapidly (Radesky et al., 2015). Continuous research is needed as contradicting research can be found regarding young children and the use of technology. Using the theory of social construction as a basis, the following topics will be discussed in the literature review in Chapter two: learning through digital play; the use of mobile technology by young children; the advantages and disadvantages of technology for children in early childhood; the importance of parental involvement and the use of technological devices by their young children; the use of technological devices for child development; and parents' views on their children's experiences with the use of technology.

1.8.1 Learning through digital play

According to Altman, Valenzi and Hodgetts (1985: 110), learning can be described as "a change taking place in behavior as a result of practice and experience". De Witt (2009) is of the opinion that children learn best through play. When children participate in play they develop on multiple levels, including physical, cognitive, social and emotional (Nicolopoulou, De Sa Ligaz & Brockmeyer, 2010). Digital applications especially designed for child development are becoming more specialized and interactive. Dinesh (2016) found

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that because it feels like they're playing a game, children using these applications are having fun and thus learning without even realizing it.

1.8.2 The use of mobile technology by young children

Young children are using mobile technology such as smartphones and tablets more frequently from a very young age (Radesky *et al*., 2015). The Fisher Price application (an application for infants) alone had three million downloads in 2011, this shows that parents are willing to download certain developmental applications for their young children to use on a mobile device (Linn, Almon, Levin, 2012).

1.8.3 The advantages and disadvantages of technology for children in early childhood

It is important to take note of both the benefits as well as the potential harm that digital technology can have on young children. When young children have access to digital technologies it does not necessarily mean that there will be a positive educational effect on the child. For digital technology to be beneficial, it is paramount that parents and children know how to use these technologies (Zevenbergen, 2007). When children use technology too extensively problems such as childhood obesity, sleep disturbance, learning problems, attention problems and social problems may occur (Linn *et al*., 2012).

1.8.4 The importance of parental involvement and the use of technological devices by their young children

According to Radesky *et al*. (2015), parenting styles play a very big role with regard to the positive and negative effects that digital technology might have on young children's behaviour and development. Where parents are actively involved when their young children use technology, pro-social behaviour can be promoted (Linn *et al*., 2012). When parental supervision is absent whilst a young child is using digital technology, the child might get addicted and require therapy (Ward, 2013).

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1.8.5 The use of technological devices for child development

Child development includes physical, cognitive, emotional, social, moral-normative and personality development (de Wit, 2009). Applications that are developmentally meaningful for children should adhere to three conditions: (1) the application must be designed to accommodate the developmental stages and needs of young children; (2) the content must be designed to promote young children's development in areas such as cognition, academic skills, social skills and physical development; and (3) the application should engage children in activities and behaviours that foster optimal developmental assets (Chau, 2014).

1.8.6 Parents' views on and experiences of their children's use of technology

Digital technologies are becoming more popular in the classroom. According to a study done by Couse and Chen (2010), 89.1% of parents allowed their children to participate in a study where they had to use touchscreens in the classroom. In a recent study conducted by Wood *et al*. (2016), over 94% of parents allowed their children between the ages of 0 and 6 years to use a digital device, while in another study Vittrup *et al*. (2016) found that some parents felt that technology exposure for young children between the ages of 0 and 3 years is important for early brain development. They also found that some parents strongly believe that their children will fall behind academically if they are restricted from using digital technology. Although a lot of parents felt that technology exposure is important at a young age, parents still had a few concerns, for example that their child might get addicted to digital devices (Ofcom, 2014).

1.9 RESEARCH METHODS

In this study a deterministic philosophy was followed within a post-positivist paradigm. The underlying approach in this research was quantitative with a non-experimental research design through the use of an online survey.

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1.9.1 Paradigm

A deterministic philosophy was used to choose the research approach; a deterministic philosophy holds that causes (probably) determine effects or outcomes (Creswell, 2014). The problem thus reflects the need to identify and assess the causes that influence outcomes, such as found in experiments.

1.8.2 Research Approach and Research Type

The research was quantitative with a non-experimental design through the use of an online survey.

1.9.3 Sampling and Research Instruments

I relied on snowball sampling to get my survey shared on social media platforms. An online questionnaire was used to collect the data. The questionnaire was distributed online through social media platforms such as Twitter, Facebook, Pinterest and LinkedIn.

1.10 ETHICAL CONSIDERATION

The University of Pretoria's ethics committee has approved my ethical application in March 2017. I have also adhered to the University of Pretoria's ethical principles throughout this study.

1.11 OVERVIEW OF STUDY

Provided below is an outline of this study:

Chapter 1: Background and orientation

This chapter serves as an introduction to this study. The reader is provided with a background to the study, the problem as well as the rationale of the study are discussed, and the research

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objectives and questions, concept clarifications and the research approach and contributions are all outlined.

Chapter 2: Rationale of the study

Relevant literature is discussed in this chapter. The focus is on the specific research questions of this study. An overview of a wide spectrum of literature is offered with regards to the use of technology by young children and their parents' feelings towards it.

Chapter 3: Research design and methods

This chapter deals with the research methods used in this study. Reasons are given as to why certain methods and approaches were used in order to answer the research questions.

Chapter 4: Results of online survey

In this chapter results from the online survey are presented.

Chapter 5: Findings and recommendations

The research questions, conclusions and recommendations are addressed in this chapter, which includes final suggestions for further research.

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CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

Among today's parents there seems to be a broad consensus that early exposure to digital media is less enriching than real-life experiences (Wooldridge, 2016). This concern may rightly apply to traditional media such as television, but on the contrary mobile devices such as smartphones and tablets are often marketed as supplemental learning tools for children (Kirkorian *et al*., 2009; Christakis, 2014; and Apple, 2016). There is contradictory research concerning young children and the use of mobile technology, with some researchers supporting the notion that young children can use digital technology to their advantage (Radesky *et al*., 2015; Kirkorian, Choi and Pempek, 2016; Kucirkova, 2016 & Kalas, 2013). On the other extreme (Linn *et al*., 2012) and de Bravo and Beaupre (2016) believe that young children should not use technology at all if they are younger than two years old, and only for 1-2 hours a day if they are older. Researchers such as Zevenbergen (2007) and Radesky *et al*. (2015) believe that parental involvement is key for technology to be beneficial for young children. According to Radesky *et al.* (2015), more research is needed specifically concerning young children and the use of mobile technology and the impact thereof. They recently pointed out that research on the impact of interactive devices on children's cognition cannot keep up with the pace of technological advances. Christakis (2014) agrees and mentioned that the most recent guidelines on recommended screen time were updated before the first tablets even made it onto the market.

The focus of this chapter was on the most recent and relevant literature concerning: learning through digital play, the use of technology by children in early childhood and the advantages and disadvantages of technology for children in early childhood. The chapter will also focus on the importance of parental intervention with the use of technological devices, the use of technological devices and child development, and parents' views on the use of technological devices by their children in early childhood will be discussed.

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2.2 LEARNING THROUGH DIGITAL PLAY

Learning can be described as a change taking place in behavior as a result of practice and experience (Huitt & Hummel, 2006). Ogunyemi and Ragpot (2015, p.2) define play as "the primary engine of human growth, it's universal – as much as walking and talking. Play is the way children build ideas and how they make sense of their experience and feel safe". The United Nations emphasises the importance of play by making play a specific right for all children (Honeyford & Boyed, 2015). The South African government also recognizes a child's need for development and to engage in play. Every child in South Africa thus has the right to play (South African Human Rights Commission and UNICEF South Africa, 2011). Through play, a child discovers the world and this includes learning (de Witt, 2009).

According to Fleer (2014), children must deal with new demands of reading, writing and mathematics when they start school. This means that they have to move from a leading motive of play to one of learning. The creation of the activity setting in an early childcare center orients the child towards either a play or learning motive (Fleer, 2014). When participating in play children develop on multiple levels including physical, cognitive, socially and emotionally (Nicolopoulou, De Saligaz & Brockmeyer, 2010). It is a teacher, parent or caregiver's responsibility to create an activity setting that offers activities that support children's play and promotes learning at the same time. Ogunyemi *et al*. (2015) agree and state that work and play cannot be separated, there should be a balance between the two, thus providing the avenues for children not only to explore the environment around them, but also to build their personality and construct knowledge at the same time. According to Council of Ministers of Education, Canada (2010), play-based learning can also contribute to greater social, emotional and academic success. The National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College in the United States of America (2012) believe that children need to freely explore and test their environments, this includes the exploration of technology tools and interactive media.

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According to Marsh, Plowman, Yamada-Rice, Bishop and Scott (2016) the nature of play in the digital age is clearly changing with regards to resource availability for play and the ways in which those resources are deployed in different types of play. Digital applications designed for children are becoming more specialized, interactive and fun. According to Dinesh (2016), children take great pleasure using these applications and they are learning without realizing it, because it feels like playing a game. Prensky (2001 p.145) describes "Digital Game-Based Learning" (DGBL) as "any marriage of educational content and computer games". Kulman (2015) describes digital play as a voluntary, energizing activity that involves digital technologies, such as video and computer games, cell phones, iPads and tablets. Fleer (2014) argues that the introduction of digital devices creates new possibilities not only for play but also learning.

Mitgutsch (2008) gives several reasons why children learn through computer-based games, namely: computer games follow simple principles of instant winning and losing outcomes within a fantasy world; aesthetic modelling and recognizable features are used to engage the child's attention by stimulating the child's enjoyment with visual feedback; the environment is interactive and provides immersive experience; and the child is given different solutions and ways of solving problems. It is important to note that not all play is meaningful or educational. Meaningful play refers to specific activities that lead to worthwhile ends. It is thus important that play must be well conceptualized beforehand to meet evaluation, relational and instrumental criteria (Ogunyemi *et al*. 2015). According to Ogunyemi (2012), evaluation relevance has to do with the general purpose of play in education, relational narrows it down to the goals of play, and instrumental relevance refers to the connection between play and activities such as reading, mathematics and science. When play leads to cognitive stimulation that is supportive of human development, then it is regarded as educative play (Ogunyemi *et al*. 2015).

2.3 THE USE OF MOBILE TECHNOLOGY BY YOUNG CHILDREN

A new generation has evolved due to the rapid expansion of technology into the lives of children in early childhood. According to Malcom Gladwell, there is a seismic generational shift under way due to the fact that more and more of the millennial generation enter the workforce (Menza, 2013). The Baby Boomers (people born between 1946 and 1964) organized their world into disciplined hierarchies, whereas the Generation Y (those born after the late 1970's) organizes their world around the open, flexible and decentralized networks. Malcom Gladwell said in the TD Ameritrade conference "The millennial generation has never known a world without cellphones, Internet, texting and Twitter and that has profoundly shaped the way they see things," (Menza, 2013). The Generation Y has various names including 'Millennials', 'Nexters' and 'Generation Why' (Zevenbergen, 2007). With the rapid change of technology, young children are increasingly using interactive screen media such as smartphones and tablets (Radesky *et al*., 2015). According to Wood, Petkovski, Pasquale, Gottardo, Evans and Savage (2016), parents indicated a preference for very early introduction to mobile technologies for their young children. According to Holloway, Green and Livingstone (2013), early interaction with computers is a global phenomenon, 3-4 year old children are going online with proportions ranging from 25% in the United States to 78% in the Netherlands.

The Australian Bureau of Statistics (2000) announced that as early as 1998, 48% of Australian children aged four or younger had a computer. According to Sebele (2015), 41,2% of South African children aged 5 years or older live in households where at least one member uses the internet. A survey conducted in conjunction with the South African chapter of the Interactive Advertising Bureau showed that the vast majority of South African desktop internet users have smartphones and that 91.7% use their smartphones to access the internet (Thomas, 2014). Parents' own media use is an important predictor of how extensively children are allowed to use digital technology. Children spend more time on digital devices when their parents use digital media often (Nikken *et al*., 2015). Formby (2014) found in a study that parents from all age groups allowed their young children to use digital technology. 70.1% of the parents who allowed their young children to use digital technology were

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between the ages of 18-30, whereas 69.5% of the parents were between the ages of 31 and 35 years. 80.4% of the parents were between the ages of 36-40 years and 69.6% of the parents were over 41 years old. This suggests that younger parents do not let their children use technology more than older parents, as one might think. Marsden (2013) agrees and states that the parents' age does not have a significant effect on children's use of technology but rather how easy parents find the use of technology.

Children start to use technology devices not only more frequently but also at a younger age. The Australian Bureau of Statistics (2000) indicated that 29% of babies under the age of 1 watched television and videos for about an hour a day, whereas 64% of babies and toddlers watched television at the age of 2 years for at least 2 hours a day. Carson, Tremblay, Spence, Timmons and Janssen (2013) found that children aged 2-4 years spend an average of 8.4 minutes per day engaged with computers. Healthy Active Kids South Africa (2014) reported in their 2014 report card that South African children spend more time in front of screens and are being less active. Educational applications for young children are on the rise and so is the amount of downloads of these applications (Linn *et al*., 2012).

Parents download applications for their children for various reasons. It is estimated that in 2011 the Fisher Price applications (applications for infants and toddlers) alone had three million downloads (Linn *et al*., 2012). In a study done by Kabali, Irigoyen, Nunez-Davis, Budacki, Mohanty and Leister (2015) it was found that 60% of parents give their children a mobile device while they are running errands, 73% of parents while they are busy with chores and 65% used mobile devices to try and calm their children. Cristia and Seidl (2015) conducted a study and found that only 24% out of 450 infants (12-14 months) have never used a touchscreen before. Statistics regarding South African babies and screen time is still not available according to the director of Media Monitoring Africa, William Bird (Nair & Govender, 2016). Ward (2013) stresses that children's screen time should be closely managed.

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The Australian and United States policy makers recommend that children under the age of two have no screen time due to the addictive features of tablets (American Academy of Pediatrics, 2001; Australian Department of Health, 2014). They also recommend that children aged two to five years spend only one hour per day on digital technology and children older than five at most one to two hours per day. However, according to Neumann (2015), research has shown that pre-school children are exceeding these recommended screen time guidelines, especially since the release of touchscreen tablets. Sweetser, Johnson, Ozdowska and Wyeth (2012) suggest that the national screen time parameters should be reassessed and take into account not only the variety of digital technology that children are using but also the purpose for using specific devices. With the increased usage of technology by young children, it is important to take note of the benefits as well as the potential harm thereof.



2.4 THE ADVANTAGES AND DISADVANTAGES OF TECHNOLOGY FOR CHILDREN IN EARLY CHILDHOOD

Having access to technologies does not necessarily mean that it will have a positive educational effect on a child. According to Zevenbergen (2007), it is necessary to know how to use these technologies effectively for it to be beneficial. Linn *et al*. (2012) believe that when children use technology with screens too extensively problems can occur which may include childhood obesity, sleep disturbance, learning problems, attention problems and social problems. According to Dr. Ingrid Artus, screen time appears to replace interactive playtime with children in South Africa which include hugs, cuddles and direct talk with babies. She believes that many South African parents use screen time as a type of babysitter

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(Nair *et al*., 2016). Zevenbergen (2007) on the other hand believe that digital technologies such as touchscreens and computers can be beneficial for learners with regard to being more socially active. He states that in a study done by Clements as early as 1998, it was found that children were more interactive with each other whilst playing computer games in pairs than when they were building puzzles together. According to Kalas (2013), the model that a child is passive in front of the computer screen can only hold until one has actually experienced young children interacting with any form of technology. The engagement, social interactivity and collaboration are immediately very clear, as well as the fact that a child's creativity is stimulated and that there is clear potential for learning. Due to the rapid advancement in the development of mobile devices, software programs are designed to promote exploration, discovery, play and development of skills relating to cognitive and social development (Wood *et al*. 2016). Christakis (2014) is of notion that technological devices can even be beneficial for children younger than two years.

Christakis (2014) conducted a study comparing three different devices used by children younger than the age of two years. The devices were: traditional toys, touchscreen devices and television. He found that traditional toys are reactive, can promote joint attention, are highly portable as well as 3-dimensional (3D). In comparison, the touchscreen devices are reactive, interactive, tailorable, progressive, promotes joint attention and are highly portable. In vast contrast, the television has none of the above mentioned features (Christakis, 2014). In addition to the latter, Christakis (2014) found that touchscreen devises are not 3D, and therefore new technology, for example augmented reality on touchscreen devices, should be considered.

Augmented reality can be very beneficial for young children. Carmigniani and Furht (2011, p.3) defines augmented reality as "a real-time direct or indirect view of a physical real-world environment that has been enhanced/augmented by adding virtual computer-generated information to it". Augmented reality is structured in 3D; it is interactive and combines virtual and real objects. According to Chen (2009), by using augmented reality the information about the surrounding real world of the user becomes interactive and can be

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digitally manipulated. In other words, augmented reality takes existing pictures and blends new information into it. Augmented reality is very effective in development as seen in the research conducted by El Stayed, Zayed and Sharawv (2011). They used augmented reality systems to present lessons in 3D format so learners could virtually manipulate a variety of learning objects and handle the information in a novel and interactive way. Contrary to Chrisakis, de Bravo *et al*. (2016) believe that children under the age of two should avoid all screen time, mainly due to research showing that screen time is a direct contributing factor for obesity.

Children older than two years should not use a screen for more than 2 hours per day according to de Bravo *et al*. (2016), they also believe that screen time is more likely to bring out aggression in children. Linn *et al*. (2012) agree and argue that if children are exposed to media violence they may tend to be more angry and aggressive, which can also lead to poor school performance. They also found that if preschoolers watch a fast-paced cartoon show for longer than 20 minutes, the impact on the child can be negative. In such cases problem-solving, self-regulation, the ability to delay gratification, executive functioning skills and attention span can be negatively affected. The American Academy of Pediatrics and other public health organizations are of the opinion that it is best if children under the age of two do not have screen time at all, and older children no more than 1 to 2 hours per day, excluding school work (Linn *et al*., 2012). Screen addiction can also have a negative effect on children, and according to Christakis and Zimmerman (2006), the time a young child spends with technological devices will only increase as he or she gets older.

Radesky *et al*. (2015) believe that the above mentioned barriers can be overcome through proper parental supervision. They believe that many factors, including parenting style, socio-economic status, and child temperament, modify the positive and negative effects of media on children's behaviour and development. Most important is parent-child (or teacher-learner) interaction during media use. This notion relates to Vygotsky's 'Zone of Proximal Development' or ZPD. Vygotsky believed that children learn not only through the use of

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tools and artefacts, but also through their interactions with adults and more able peers (Vygotsky, 1978).

2.5 THE IMPORTANCE OF PARENTAL INVOLVEMENT AND THE USE OF TECHNOLOGICAL DEVICES BY THEIR YOUNG CHILDREN

Parenting style plays a very big role with regard to the positive and negative effects of media on young children's behaviour and development (Radesky *et al*., 2015). Linn *et al*. (2012) believe that pro-social behaviour can be promoted when parents are actively involved when their children (older than 3) use technology. They believe that learning can only take place if an adult is involved whilst a young child (older than 3) is using digital technology. According to their research, learning through technology cannot take place, even with the assistance of an adult, if the child is younger than two years old. Wood *et al*. (2016) found in their study that parents provide a great deal of support to their children while interacting with touchscreen tablet devices. This includes verbal, emotional-verbal, physical and emotional-physical support. According to Ward (2013), children that use tablet computers without parental supervision may become addicted and may even require therapy. In the United Kingdom, a four-year-old girl received compulsive behavior therapy due to the fact that she got increasingly distressed and inconsolable whenever her iPad was taken away from her. Wood *et al*. (2016) states that to best facilitate mobile devices, parental scaffolding needs to be present.

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Scaffolding refers to "the use of techniques or tools that would allow a child to reach a particular goal that would otherwise be unattainable through unassisted efforts" (Wood *et al.,* 2016, p.2). According to Lev Vygotsky (1978), learning or cognitive development takes place through social interaction with either adults or more able peers, Vygotsky calls this the 'Zone of Proximal Development' (ZPD). The ZPD can be seen as a gap between the things that learners can and cannot do. Kuusisaari (2014) is of meaning that a child needs parents or more abled peers to bridge the "gap" between what they can and cannot do. Without this additional assistance the learning activity cannot be easily completed. Three types of scaffolding are identified by Yelland and Masters (2007) with regards to stationary computers: cognitive, affective and technical scaffolding.

Cognitive scaffolding is when parents model, ask questions and facilitate children's understanding of concepts. When the parent provides encouragement and feedback, affective scaffolding is involved. Technical scaffolding is when immediate feedback and automatic leveling takes place through the use of software designs with built in learning strategies (Grant, Wood, Gottardo, Evans, Philips & Savage, 2012). In a recent study, measured by a pre-test and post-test it was found that children demonstrated cognitive gains when parents gave support whilst using stationary desktop computers (Flynn & Richert, 2015).

It is well established that when young children use digital technologies, parents play an important role in mediating young children's interactions and experiences (Connell, 2015). According to Livingstone and Helsper (2008), parents can follow various mediation styles, such as restrictive mediation, where parents pose restrictions on time spent on digital devices. Parents can also use active mediation by giving their children explanations and instructions on how to use digital devices or they can co-use the media with their child. Supervision is another form of mediation that can be used, as well as monitoring of their child's online activities by for example checking the browser history from social media applications. Technical restrictions, where parents can use 'parental controls' provided by media devices to regulate or block inappropriate content, are also an option.

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Every family is different and has unique circumstances and needs, thus it may be beneficial to help parents to be more mindful about their young children's use of digital technology. Neumann (2015) suggests that the following framework of '5W' questions (Who? What? Where? Why? and When?) can be used to help parents become more mindful. According to Neumann (2015), the answers to each question will guide parents to adjust their young child's use of digital technology, which will in effect lead to positive and healthy screen time experiences. By adopting a mindful approach to young children and the use of digital technology, parents not only reflect upon their young children's use of digital technology but also help to positively influence children's behaviours. Neumann (2015) also suggests that parents should restrict Wi-Fi access to avoid children downloading low quality or inappropriate applications. According to Radesky *et al*. (2015), a balance is needed between the engagement that interactive media creates and the distraction that it can cause.

Radesky *et al*. (2015) state that learn-to-read applications and e-books, for example, can encourage a child to practice letters, phonics and help with word recognition, but that it can also be over stimulating. Some e-books have such elaborate visual designs, sound effects or swipe options that it can distract the child from the educational content. Parents should be aware of this and try to find a balance that suits their child as to not over or under stimulate them. Parents should be vigilant while their children use technology. As mentioned before, Christakis *et al*. (2006) stated that children can become addicted to technology and as they grow older their frequent use of technology increases.

With the frequent use of technology younger children could be at risk of future bullying through social media on digital devices. According to Bond (2013), mobile phones play a fundamental role in maintaining and managing children's friendships, but it also has a darker side. It has been well documented by the media that mobile phones are causing an increase of risky relationships, bullying and stalking under young children. With the increase in usage of technology under young children, a different generation with different developmental patterns emerges. It is very important that adults monitor and support the ongoing use of

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digital devices and software programs to maximize children's engagement, learning and safety (Wood *et al*., 2016).

2.6 THE USE OF TECHNOLOGICAL DEVICES FOR DEVELOPMENT AND LEARNING

According to de Wit (2009), child development includes physical, cognitive, emotional, social, moral-normative and personality development. Physical development refers to the physical growth of the body, whereas cognitive development refers to aspects and functions relating to thinking and ideas (de Wit, 2009). According to Eloff and Ebersohn (2004), emotional development pertains to a child's increased understanding of his or her own feelings and the development of suitable behaviors in response to those feelings. Social development means to interact appropriately in social situations and the ability to relate to others, whereas moral-normative development is related to a child's awareness of the difference between what is right and wrong (Eloff *et al*., 2004). Personality, according to de Wit (2009), develops continuously and includes the development of the total person, including the evaluations and view of him or herself. A common misunderstanding in comparison of devices occurs in the association of touchscreen devices and television, as you can, for example, watch movies on both of these devices. Christakis (2014) is of the opinion that acquired research on television applies only to iPads or touchscreen devices when the devices are only being used to watch something. When the above mentioned devices are used in the context of one of the thousands of interactive applications currently designed for educational development, there is warrant for significant theoretical and practical consideration.

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Chau (2014) argues that a developmentally meaningful application has to adhere to three conditions: (1) the application must be designed to accommodate the developmental stages and needs of young children; (2) the content must be designed to promote young children's development in areas such as cognition, academic skills, social skills and physical development; and (3) the application should engage children in activities and behaviors that foster optimal developmental assets. According to Paddock (2011), there are a lot of products being marketed as "educational" for toddlers and babies, but there is no evidence to support the notion that it is indeed educational. Her report also claims that studies have shown that due to the lack of understanding on the use of these electronic programs, these programs can only be educational for children older than 2 years. Yet according to Elisabeth McClure, a researcher who focuses on children and media at Georgetown University, a baby as young as 6 months old can tell the difference between a character on a television show and a real person's interaction on Skype (a telephony service provider that includes live video chat) (Lafrance, 2015). McPake and Plowman (2013) also found in their study that children from 9 months old would take a cell phone and try to mimic 'talk'. Even though the child was only at the babbling stage the child was showing signs of communication development, clearly understanding what the phone was for.

In a report conducted by Paddock (2011) it was mentioned that children who watch a lot of television and other media have a higher risk of delayed language development when they start school. He claimed that young children learn best by interacting with humans and not screens. Similarly, Miller (2005) states that if children use technology, for instance television or computers at too early an age or too extensively, it would hinder the child's development. In contrast, research done by Hatch (2015) showed that technology can be used to help children get ready for formal learning. The researchers assessed 87 preschoolers randomly selected before the school year started. At the beginning of the study 46% of the preschoolers (the majority were from a low-income household) were ready to read and 72% were ready to learn mathematics. The researchers introduced a TeachSmart learning system and assessed the same preschoolers again after six months. By then 82% of them were ready to read and 92% were ready to do mathematics (Hatch, 2015).

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McPake *et al*. (2013) found in their study that children at the age of three were already aware of the role of speech and also of the written language in their environment because of the use of technology. They also found that it can be very beneficial for a child to watch television at a young age, as it can lead to a desire to read related stories and encourage play with or without peers by pretending to be a certain character. During their study, they found that a three-year-old boy could identify the names of his preferred programmes and plan future viewings by using the television guide (McPake *et al*., 2013). This is clearly a form of reading development and self-efficiency at a very young age. According to Zevenbergen (2007), computers can offer not only new skills but also new ways of learning. He refers to a case study where he observed a young boy, who was four years old and just about to start preschool.

The boy, Matthew, was just recently exposed to a computer in their house as his sister (8 years old) was starting to use one at her school. Their parents did not know how to use the computer. In just 3 weeks, Matthew learned the following by observing his sister: he could turn the computer on and off; insert compact discs and upload programmes from these disks; play games; navigate around programmes; change and save the screen saver; and solve problems in the sense that if he miss clicked an icon, he could determine how to rectify the situation. He also acquired a significant vocabulary of computer related terms. Although Matthew could not yet write his own name, he was able to type both his and his sisters' names and change the font style, colour and size. This correlates with Vygotsky's 'Zone of Proximal Development' which states that in order for children to develop cognitively, they require support and social interaction from either adults or more able peers (United Nations Educational, Scientific and cultural organization, 2002). Matthew developed his literacy skills by "reading" the content on the screen in a multimodal sense (letter recognition and iconography). He not only developed his social skills by asking adequate questions when he needed assistance, but also his computer and fine motor skills by moving the mouse around on the screen, clicking on items and drawing lines and objects. In contrast to Zevenbergen, Linn *et al*. (2012) state that there is evidence that children learn better if they have limited

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access to computers. They also state that video games do not enhance learning for preschoolers.

It was found in a study by Marino, Vieno, Lenzi, Borraccino, Lazzeri and Lemma (2016) that 15.8% of children in the particular study experienced difficulty with sleeping when they used a computer. Research strongly suggests that both inadequate sleep quality and quantity are linked to sleepiness, inattention and behavioural deficits that may hinder daytime functioning as well as long-term development (Beebe, 2011). Mobile devices such as smartphones and iPads are small and mobile, this allows children to use it in their lap, on the floor or on a table within their home without any difficulty. Touchscreen tablets not only stimulate children's visual, auditory, tactile and kinesthetic sensory systems, but also provides immediate feedback. Thus, children are enabled to grasp the technology quickly and explore new things, learn new skills and gain more knowledge (Wood *et al*., 2016). According to Kalas (2013), it is essential that preschool teachers identify and respect young children's digital and higher order skills, and to provide opportunities to cultivate them further. One could argue that a child would be disadvantaged if he or she is not allowed to partake in any activities involving technological devices. Zevenbergen (2007) states that this is a new generation of children and older generations, which include both teachers and parents, need to adapt and accept these changes.

2.7 PARENT'S VIEWS AND EXPERIENCE OF THEIR CHILDREN'S USE OF TECHNOLOGICAL DEVICES

Zevenbergen (2007) found that when compared with older generations, the millennial generation has developed different numeracy dispositions and skills. The younger generations

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are more comfortable to defer cognitive labour to technology, whereas the older generation would feel it is bad practice. Downes (2001) argues that there are a limited number of computers in the early childhood setting, not only due to financial reasons but also due to resistance from the community who views these tools as neither appropriate nor important. Within the new technological age we find ourselves in, parents might be more reluctant to let their children use technology at an earlier age.

In a study done by Couse and Chen (2010), 89.1% of parents allowed their children between the ages 6 and 8 to participate in a study where they used touchscreens in the classroom. Wood *et al.* (2016) found in a recent study that over 94% of parents allowed their children to use digital technology between the ages of 0 and 6 years. In 2011, 60% of the top 25-selling apps on Apple's app store targeted young children (Judge, 2014). During a survey conducted in the United Kingdom in 2014 it was found that approximately 75% of 3-4, 87% of 5-7 and 88% of 8-9-year-old children played games on their own on digital devices (The Statistics Portal, 2016). This suggests that parents are willing to let their children use technology from a young age and without supervision. According to Burrows (2015), South Africa's middle class is growing steadily, resulting in more families owning digital devices. Parents are also becoming more willing to let their young children use digital technology. Vittrup *et al*. (2016) found that 32.6 % of parents participating in their study felt that technology exposure to young children (0-3) is important for early brain development. They also found that 32.7 % felt that their child will fall behind academically if they are restricted from using technology.

In a study conducted by Neumann (2015), parents indicated their beliefs about children's access to touchscreen tablets both at home and in an early childhood educational setting. She found that 2.9% of parents strongly disagree that children should have access to tablets at home, 18.8% disagree, 34.8% neither agree nor disagree, 33.3% agree and 10.1% strongly agree. With regards to children having access to touchscreen tablets at a preschool, 7.2% strongly disagree, 14.5% disagree, 42% neither agree nor disagree, 26.1% agree and 10.1% strongly agree. The American Speech-Language-Hearing Association (2015) found in their study that not only do 66% of parents feel that young children's communication skills can be

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enhanced through appropriate use of digital technology, but that 72% of parents believe that their communication with their young children has increased due to the use of digital technology. Although many parents allow their children to use digital technology, research shows that parents do have concerns.

Ofcom (2014) found that parents were concerned that the addictive features of tablets may impact their child's social, physical and cognitive development negatively. They were also concerned that tablets may reduce time for more traditional non-digital activities. Many parents become less confident and more worried regarding the use of technology as their child gets older. According to research done by the Family Online Safety Institute (2014), 73% of parents felt confident that they could track and monitor their young child's use of technology, whereas that number drops to 58% concerning teenagers and the use of technology. They also found that regardless of the child's age, the majority of parents (53%) feel that their child will potentially benefit more from using digital devices than being harmed by them. Many parents were ambivalent, feeling that the benefits and potential harms were equal. Only 5% of parents felt that the potential harm of digital technology outweighs the benefits. Wood *et al*. (2016) found that parents had multiple rationales as to why they let their children use technology from a young age, 56.7% of the parents said because it is fun and entertaining. Other rationales include promoting development in problem-solving (53.8%), basic math (53.8%), reading (51%), language (47.1%) and science (26%).

2.8 THEORETICAL FRAMEWORK

In order to better understand parents' experiences regarding young children and the use of technology, I have decided to base my study on the theory of Social Construction of childhood in conjunction with the concept of prolepsis.

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The theory of the 'Social Construction of Childhood' seeks to understand how children and childhood knowledge is constructed, by whom and for what reason, and most importantly what purpose it would serve (Norozi & Moen, 2016). According to Norozi *et al*., Social Constructionism is grounded in varying conceptions among different cultures, societies and different times in history and offers alternative ways to find out about children and childhood. There is also an emphasis on the diversity of situations and circumstances in which childhood is experienced. James and James (2008) define Social Construction as "a theoretical perspective that explores the ways in which 'reality' is negotiated in everyday life through people's interactions and through sets of discourses" (p.122).

According to O' Connor (2016), it seems clear that parental perspectives are mixed with regards to children in early childhood and the use of technology, and the rates of use by children at home are closely related to their parents' perceptions of the benefits and/or drawbacks of such use. Two dominant discourses are evident in the literature around parenting and children's use of technology, and it is useful to locate these in relation to the 'Social Construction of Childhood' theory (James & Prout, 2015). Some researchers consider technology to be beneficial for young children (e.g. Burke & Marsh, 2013) while other researchers remain cautious due to the potential negative impact (e.g. Vanderwater, Rideout, Wartella, Huang, Lee, & Shim, 2007).

Within this theoretical framework, childhood is understood as "plural and diverse, informed by cultural discourses which influence how children are treated, conceptualized and behaved towards in the wider society, and how they are parented and educated at home and at school" (O' Connor, 2016, p.237). The first discourse in terms of young children and the use of technology is the perception that young children are innocent, natural and in need of shielding from the adult world (Higonnet, 1998). Psychologist Sue Palmer (2016) believes that children should be protected against technology, as she sees technology as robbing children of their childhood. According to her, technology is toxic and it is polluting children, she believes that children become slaves to screens that can lead to obesity, aggression and

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depression. In August 2000, a group called the 'Alliance for Childhood' published a scholarly report called *Fool's Gold: A Critical Look at Computers in Childhood*. In this report they claimed that computers are hazardous toward children in various ways, including emotionally, intellectually, morally and physically (Harvey, 2000). According to O'Connor (2016), this type of panic-mongering around technology is often taken up in the right-wing press, further establishing the correlation between being a 'good parent' and limiting your child's access to technology.

Project Wild Thing (Bond, 2013) and the Identification of 'nature-deficit disorder' (Louv, 2010) also belongs to this discourse, as they believe that children should rather be outdoors in nature than indoors with technology. According to the concept of prolepsis, a key influence on parents' interactions with their children derives from projecting their past memories into their children's futures (Cole, 1996). This means that if parents have bad experiences or are struggling with technology, they might not allow their children to use technology because they believe that their children will have the same experiences (Mc Pake *et al*., 2010). The alternative discourse is the growing recognition of the positive impact that technology could have on children in terms of learning, playing and socialising. In this discourse a 'good parent' is someone who encourages their children from a young age to use technology to enable them to have better educational outcomes and to have more successful experiences in the world of work (O'Connor, 2016). Vittrup *et al*. (2016) found that in the United States of America parents overall showed positive attitudes with regards to their young children (2-7 years) and the use of technology. In this study, it was reported that 68.5% of the 101 parents who took part in the survey, believed that the introduction of technology from a young age will be better for tomorrow's workforce. This study also found that 33% of parents believed that children may fall behind academically if they were restricted from using technology.

2.9 CONCLUSION

In this chapter I presented the literature I have studied on young children and their use of technology, as well as the impact thereof on the development and education of these young learners. To understand young children and the use of technology, the following topics were

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discussed: learning through digital play, the use of mobile technology by children in early childhood, the advantages and disadvantages of technology for children in early childhood, the importance of parental involvement and the use of technological devices by their young children, and parents' views on the use of technological by their children in early childhood.

It is clear that digital technology is part of our everyday lives, and with technology changing rapidly it has become more accessible to people from all income groups. Due to this, children are using digital technology from a very young age. Although there are two dominant discourses that are evident in the literature regarding parenting and children's use of technology, it is clear that play is essential for young children and their development. Digital devices can create new possibilities for play and learning, but it is parents' and educators' responsibility to make sure that the applications are educationally sound and appropriate. Parents should also be actively involved while their young children use digital technology. There are various advantages and disadvantages when young children use digital technology, but it could be argued that by not allowing children to use digital technology from a young age, children will fall behind academically. Digital technology is changing daily and thus more research is needed.

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CHAPTER 3 RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

In this chapter, I firstly discuss the research design which includes the research paradigm and research approach. Secondly the research methods are discussed, which include the research sampling procedure, the data collection instruments and the variables in the study. Lastly, the data analysis procedure is discussed, followed by the quality criteria of the study.

3.2 RESEARCH DESIGN

In choosing my research approach I used a deterministic philosophy. According to Creswell (2014), a deterministic philosophy holds that causes (probably) determine effects or outcomes. The problem thus reflects the need to identify and assess the causes that influence outcomes, such as found in experiments. Through a post-positivist lens, knowledge is based on careful observation and measurement of the objective reality that exists “out there” in the world (Creswell, 2014). Thus, it is paramount for the researcher to collect information on instrument-based measures completed by respondents (Phillips and Burbules, 2000).

3.2.1 Post-positivist paradigm

The post-positivist tradition comes from 19th-century writers such as Comte, Mill, Durkheim, Newton, and Locke (Smith, 1983), more recent writers are Phillips and Burbules (2000). This paradigm is also known as the scientific method, or doing science research, it is sometimes also referred to as positivist or post-positivist research, empirical science and post-positivism (Creswell, 2014). Post-positivism represents the thinking after positivism, challenging the traditional notion of the absolute truth of knowledge (Phillips & Burbules, 2000). According

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to Creswell (2014), post-positivism recognizes that we cannot be absolutely positive about our claim of knowledge when dealing with the behaviour and action of humans.

3.2.2 Underlying approach

My research was quantitative in nature with a non-experimental design through the use of an online survey. Maree and Pietersen (2013, p.145) defines quantitative research as follows: "Quantitative research is a process that is systematic and objective in its ways of using numerical data from only a selected subgroup of a universe (or population) to generate the findings to the universe that is being studied". The type of non-experimental quantitative research that I used was causal-comparative research in which I compared two or more groups in terms of a cause (or independent variable) that has already happened (Creswell, 2014).

According to Creswell (2014, pp.41-42), survey research "provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews for data collection, with the intent of generalizing from a sample to a population". For the purpose of this study I made use only of an online questionnaire distributed through various social media platforms such as Facebook, Twitter, LinkedIn and Pinterest. I chose an online questionnaire to reach more people in less time, an online questionnaire is also more cost effective than a printed survey.

3.3 RESEARCH METHODS

An online survey was conducted and distributed through the use of social media platforms, namely Facebook, Twitter, LinkedIn and Pinterest, using snowball sampling.

3.3.1 Sampling Procedures and Respondents

Snowball sampling was used in this study to ensure that as many people as possible outside of my own contacts got to see my questionnaire. Snowball sampling is a non-probability

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(non-random) sampling method, it is used when a sample is hard to find (Dudovskiy, 2011). For example, if you want to study the level of satisfaction among customers of an elite organization or brand, you will need someone to provide you with those specific customer contact details. More often than not, you will not have access to those contacts as it can be seen as a privacy issue. Snowball sampling is when participants with whom contact has already been made, refer or suggest someone else that might take part in your study (Nieuwenhuis, 2013). My questionnaire was placed online and participants had the option to refer someone or to share the survey directly with others. I posted the survey online through multiple social media platforms which then initiated the first responses. I also 'boosted' my post so that more people were able to view it.

The respondents were restricted to the following criteria: they had to be parents of children within the age range of 0 to 8 years and they must live in South Africa. The respondents had to have an internet connection, either through a computer or a mobile device to complete the survey. According to the Internet Access in South Africa 2017 study, conducted by World Wide Worx with the support of Dark Fibre Africa (DFA), 40% of all South Africans will have access to the internet in 2017 (World Wide Worx, 2017). My sample size was thus less than 40% of the population, as I have to take into account the willingness of people to respond, and the fact that I am relying on respondents to share the survey.

3.3.2 Data Collection

Online Questionnaire:

A questionnaire can be useful for both quantitative and qualitative research. When you use a questionnaire as a qualitative method the questions need to be more open-ended, whereas with quantitative research the questions are closed-ended (Dudovskiy, 2011). My questionnaire consisted of quantitative (close-ended) questions. It was distributed online through the use of social media such as Twitter, Facebook, Pinterest and LinkedIn. The questionnaire offered the respondents a reasonable range of answers to choose from. I used Survey Monkey to create and distribute my questionnaire. Survey Monkey is one of the world's leading providers of web-based survey solutions (Survey Monkey, 2009). Prior to the

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questionnaire being posted onto social media, such as Facebook, Twitter and LinkedIn for the respondents to complete, the questionnaire was piloted at the University of Pretoria with three respondents.

Questionnaires can be very time-consuming, I thus made sure that my questions were clear and to the point. I also informed the respondents when they started the questionnaire what the estimated time was for completing the questionnaire. According to Maree *et al*. (2013), a questionnaire for an adult should not exceed 30 minutes and should not contain more than 100-120 items. On average, respondents were able to complete my survey within 5 minutes. Survey Monkey offers various pricing plans, depending on the survey capabilities and restrictions. Though costs were incurred, Survey Monkey was still very economical, as it helped save time and cut other costs such as printing of questionnaires and transportation costs. By conducting the questionnaire online, I was also able to reach respondents across long distances; the downside being that I was not able to assist with issues in the questionnaire immediately.

Table 3.1 Data collection strategies.

Data collection strategies and techniques	Means of documentation	Aim
Online Questionnaire	The questionnaire was created online through the use of Survey Monkey. The survey was distributed via online platforms such as Twitter, Facebook, LinkedIn and Pinterest.	To find out what parents' views and experiences are regarding young children and the use of digital technology for learning at home

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3.3.3 Variables in the study

The following table demonstrates the variables in the study in relation to the research questions and the questions on the online survey.

Table 3.2 Variables, Research Question and Items on the Survey

Variables	Research Question	Item on Survey
Parents experiences are dependent on young children's use of technology at home	Main Research question: How do parents experience the use of digital technology by young children at home?	
In-dependent variable: Parents views **Dependent variable:** Young children's age	*Sub-question 1: What do parents view as an appropriate age for their children to use digital technology?*	See questionnaire- Young Children and the use of technology: question 12
Dependent variable: Children's use of digital technology	*Sub-question 2: How do young children use digital technology?*	See questionnaire- Young Children and the use of technology: question 6, 7 and 8
Dependent variable: Advantages and disadvantages	*Sub-question 3: What are the educational advantages and disadvantages of digital technologies for young children?*	Literature review For parents' view on this see questionnaire- Young Children and the use of technology: question 7,13, 14, 15, 16, 17 and 21
Dependent variable: Parent's view on their role and responsibility	*Sub-question 4: What are parents feelings regarding their own responsibility and that of the technology industry regarding the use of technology by young children?*	See questionnaire - Young Children and the use of technology: question 9, 10, 18, 19 and 20
Dependent variable: Parent's age	*Sub-question 5: What impact does parents ages make on their children's use of digital technology?*	See questionnaire - Young Children and the use of technology: question 2

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3.4 SUMMARIZING AND INTERPRETING INFORMATION

To make sense of the information gathered through the use of the online questionnaire, I had to make sure that all my research questions were answered through the online survey. The following questions were added in the online questionnaire to answer the main research question and the sub-questions.

Main Research Question 1

How do parents experience the use of digital technology by young children at home?

Sub-Question 1

What do parents view as an appropriate age for their children to use digital technology?

Questions in the survey:

Question 12: Respondents were asked to select an age which they believed children should be allowed to use digital technology. The responses to this question shows at what age parents felt most comfortable allowing their children to use technology for the first time. I can link the responses with the parents' age groups. Teachers can, for example, use this information to determine if parents feel comfortable with their 6-year-old (starting school) making use of technology. Application developers can also use this data to target the age groups where parents feel comfortable with the use of digital technology.

Sub-Question 2

How do young children use digital technology?

Questions in the survey:

Question 6: Parents were asked to select one or more devices that they allow their child, younger than 8 years old, to use at home. Parents had the option of selecting one or more of the following devices: tablet device or e-reader with internet access, video game console, smartphone, laptop computer, desktop computer, handheld gaming device, tablet device or e-reader without internet access, cell phone (not a smartphone) or none of these. This would

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indicate to me the devices children are allowed to use, and could be linked to both the parents' and the children's ages

Question 7: Parents were asked to indicate the amount of time they allow their child to spend on digital technology. This would indicate the amount of time (minutes or hours) young children are allowed to spend on digital devices per day. This would also give insight into how both the parents' age and the child's age play a role in the amount of time a child is allowed to use a digital device. It would also indicate the control of parents over their children's use of digital technology and how parents monitor the use at home.

Question 8: Parents were asked to indicate what their children use technology for, by selecting one or more of the following categories: reading stories, watching stories, singing songs, playing games, playing educational games, painting and drawing. Parents could also add other activities in the comment box. This would indicate what devices children use most often, for what purpose they were being used, and at what age. I would also be able to filter the results to determine which age group of parents allow their young children to participate in which types of activities.

Sub-Question 3

What are the educational advantages and disadvantages of digital technologies for young children?

Questions in the survey:

Question 11: Parents were asked to choose which statement they agreed with more, either that technology can (a) help young children between the ages of 0 and 8 years with educational development or (b) that it can be harmful for educational development. The respondents also had the option of selecting 'not sure'. This would show me whether parents were more prone to believe that technology can help their young children with their educational development or whether they believed that it was more harmful. By selecting 'not

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sure' it would show that there is a need for better awareness regarding the impact that digital technology can have on children's educational development.

Question 13: Respondents were asked to indicate their level of agreement with the statement that misuse of today's technology can be harmful to young children's development. This question would be an indication that parents either feel that technology can, when misused, have a negative impact on children's education or that it will not have a negative impact on children's education. By selecting not sure, parents would indicate that there is a need for more information regarding the misuse of digital technology and the impact thereof on young children.

Question 14: Respondents were asked to indicate their level of agreement with the statement that appropriate use of today's technology can enhance young children's development. If respondents did not agree with the statement it would mean that they do not believe that technology can be beneficial even though it was used appropriately.

Question 15: Respondents were asked to indicate their level of agreement with the statement that technology will enhance their child/children's speech and language skills. This would indicate whether parents believe that digital technology can be used for social and language development.

Question 16: Respondents were asked to indicate to what degree they agreed with the statement that due to technology, they have fewer conversations with their children than they would like to have. This would indicate whether parents feel that technology is replacing or interfering with the time parents spend conversing with their children.

Question 17: Parents were asked to indicate to what extent they believe that the exclusion of technology will disadvantage their child. This would indicate whether parents feel that it is important for their young child to know how to use technology, and that if their child does not know how to use technology it will not be a setback for the child in the future.

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Question 21: Parents were asked to indicate how beneficial digital technology can be in the following developmental areas: social development, language development, mathematics, problem solving and fine motor skills. This would indicate in which developmental areas parents feel digital technology can be of benefit to their child and to what extent. The insights gained from this question could also inform the technology industry about what parents regard as developmental areas where technology can be beneficial foe child development and education.

Sub-Question 4

What are parents feelings regarding their own responsibility and that of the technology industry regarding the use of technology by young children?

Questions in the survey:

Question 9: Parents were asked to indicate whether they limit their children's use of digital technology. This question would indicate what age groups of parents are more prone to limit their children; it would also show me what age groups of children are the least and most restricted.

Question 10: Respondents were asked to indicate to what extent they believe it is their responsibility to supervise their children whilst they use digital technology. This would indicate whether parents acknowledge that they have a responsibility to supervise their children while using digital technology and to what extent.

Question 18: Respondents were asked to indicate to what extend they agreed with the statement that the technology industry should help to educate the public regarding the safe use of digital technology.

Question 19: Parents were asked if they felt that the technology industry were educating the public enough regarding the safe use of digital technology by young children.

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Question 20: Parents were asked if it was hard to stay current with news regarding the misuse of technology and the impact thereof on young children.

Sub-Question 5

What impact does parents ages make on their children's use of digital technology?

Question in the survey:

Question 2: Parents were asked to indicate their age. This will be incorporated in the following questions on the survey:

Question 5: On a scale of 1 to 5 how often do you get frustrated whilst using digital technology?

Question 6: Which of the following technologies does your child(ren) younger than 8 years of age use at home? Please choose one or more of the following:

Question 7: How much time does your child, younger than 8 years of age spend on digital devices, such as smartphones, computer, tablets etc. daily? Please choose one of the following:

Question 8: Please indicate what your child(ren) use digital technologies for. Please choose one or more of the following:

3.5 DATA ANALYSIS

According to Creswell (2014 p. 209), quantitative data can be analysed through the following steps;

Step 1: Report on the number of respondents who completed the survey.

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I used a dropdown menu, where respondents chose their nationality. I included this question due to the fact that non-South Africans might potentially complete the survey. Survey Monkey allowed me to exclude all the surveys completed by non-South Africans. I also added a table where parents had to indicate the age of their child or children, Survey Monkey excluded all the surveys completed by parents with children older than 9 years.

Step 2: Discuss the method by which response bias will be determined.

It is very difficult to determine response bias when using an online survey, thus researchers should take steps to avoid or reduce response bias in order to conduct sound research (Furnham, 1986). To avoid response bias I made sure that my questions were easily readable and understandable. I split my 'agree or disagree' matrix questions to ensure that respondents don't just glide carelessly over the questions, to avoid straight-lining. According to Liu (2014), straight-lining is when a respondent moves down a series of statements too quickly, selecting the same answer choice for all. I also made sure that I had a balanced number of positive and negative worded questions to avoid response bias (Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

Step 3: Discuss a plan to provide a descriptive analysis.

- For multiple choice questions, Survey Monkey calculated the percentage of people who answered a certain way, and offer a wide variety of chart types that I was able to customize to be presented.
- Matrix questions used for rating or ranking answer choices included a weighted average so that I could easily see what answer was picked most often.
- I was able to use Survey Monkey to set certain rules to answers given in the survey to show me only certain responses. The following rules were applied:
    - All the questions must be answered.
    - Respondents must have children between the age of 0 and 8 years (this was applied to all the survey questions).

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- Respondents must be from South Africa (this was applied to all the survey questions).
- A certain group of parents with a certain age group of children, for example: All the responses of parents between the age of 31 -35 who have children between the ages of 6 months to 1 year (this was applied to questions 6, 7, 8, 9, 19, and 20. All the age groups of parents were compared with all the age groups of the children).

3.6 RELIABILITY AND VALIDITY

According to Haele and Twycross (2015), validity can be seen as the extent to which a concept is accurately measured in a quantitative study. My survey was designed to determine parents' experiences of young children using digital technology for learning at home. The designed survey measured what was intended to be measured, as shown previously, through appropriate research questions. I strived to produce findings that were believable and convincing. I also presented negative or inconsistent findings in order to add to the credibility of the study. My questionnaire was assessed by my supervisors to ensure content validity. My questionnaire is reliable in that it shows consistency, my questions were clear and well defined so as not to confuse the respondents.

3.7 ROLE OF THE RESEARCHER

My role as the researcher was to be the facilitator in the data gathering process. I have endeavoured to be a sensitive observer who records phenomena as faithfully as possible. For this study I was responsible for:

- drafting the questionnaire
- administering the questionnaire
- analysing the data

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3.8 ETHICAL CONSIDERATION

I applied for ethical clearance at the University of Pretoria's ethics committee and received feedback confirming approval to start my data collection process in March 2017. Mouton (2001, p.239) states that it is "essential that the rights, interests and sensitivities of those studied have to be protected". I ensured that all the ethical principles, as stipulated by the University of Pretoria's ethics committee, were upheld throughout the course of this study. These principles include the following:

Social responsibility: I accepted that I form part of a broader community and that my responsibilities therefore go beyond the academic environment.

Justice: I treated all individuals, agreements and transactions between individuals fairly. My research respondents were selected fairly and included parents from all ethnic groups and classes.

Benevolence: I did not cause any individual harm and strived to increase possible benefits and reduce possible harm.

Respect for the individual: Participation was voluntary via the use of various social media platforms. All respondents had the freedom to withhold information, in other words they did not have to answer all the questions and they had the option to quit anytime if they choose not to continue with the survey.

Professionalism: I demonstrated integrity at all times, so that others can rely on my work as being truthful and objective. I also showed quality in my research and thus, applied the highest standards of excellence with regard to the planning, implementation and reporting of research.

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Privacy: All respondents were treated anonymously and at no point was or will any confidential information be made public. The questionnaire was anonymous and respondents did not have to give their names or any other personal information like an email address.

Refraining from discrimination: No discrimination took place during this study.

3.9 CONCLUSION

In Chapter 3 the quantitative research design was described, which included the research paradigm and the research approach. The research methods followed, which included the research sampling procedure the data collection instrument and the variables in the study. The data analysis was then explained followed by the reliability and validity of the study. Lastly the role of the researcher and ethical considerations were discussed.

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CHAPTER 4 RESULTS OF ONLINE SURVEY

4.1 INTRODUCTION

In this chapter I will discuss the results and responses of the online survey. The data analysis was guided by both the primary and secondary research questions. One hundred and ninety (190) participants responded to the online survey. The criteria specified that respondents had to be a South African citizen with children between the ages of 0 and 8 years. Only 140 (74%) of the respondents met the criteria, therefore I could use only the completed 140 responses. The 50 responses that did not meet the criteria were due to surveys being incomplete, respondents being non-South Africans or their children being 9 years or older. Therefore their responses were rejected.

4.2 DESCRIPTIVE ANALYSIS

4.2.1 Q1: What is your nationality?

Of the 190 respondents who participated in the online survey, 74% were South African citizens with children between the ages of 0-8 years. 16% of the South African respondents had either not completed the survey in full or had children older than 9 years and were also eliminated. One possible reason for the relatively high amount of completed responses is that parents are showing a keen interest in their children's use of technology (Chaudron, 2015). The aim of this study was to focus on South African parents' experiences of children using digital technology for learning at home.

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4.1.2 Q2: How old are you?

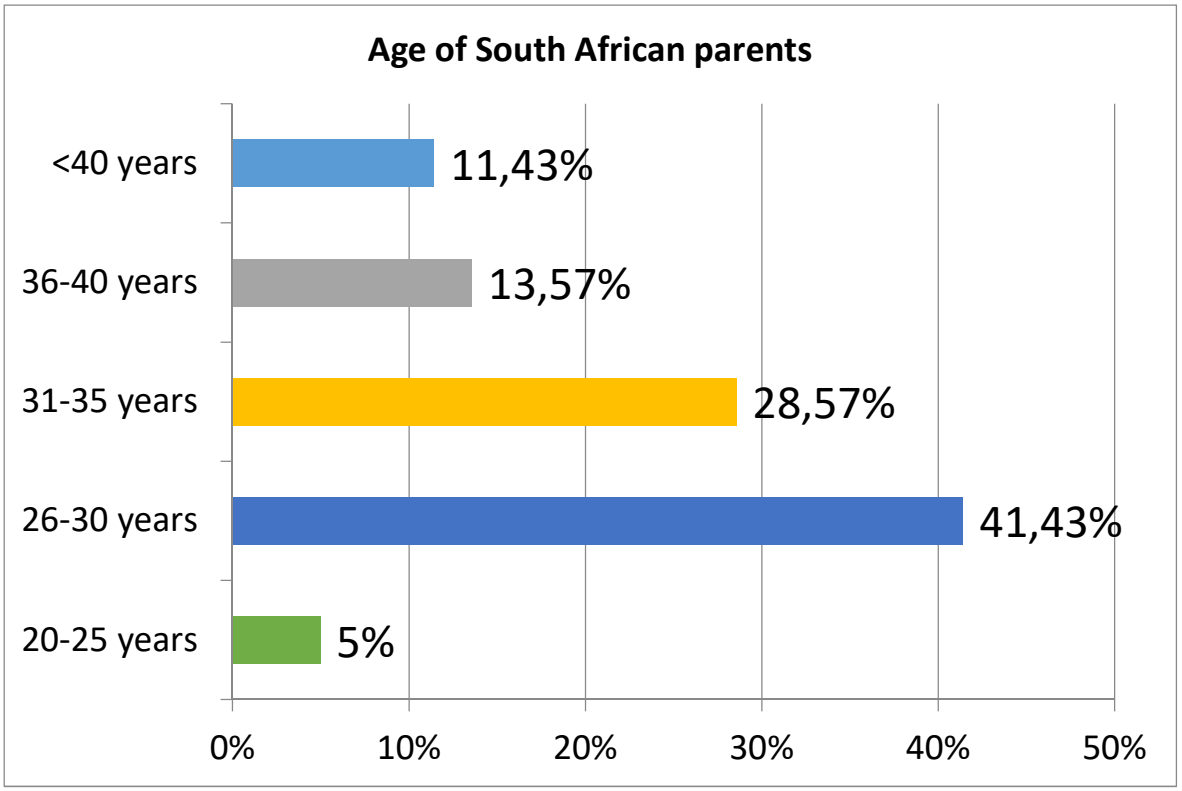

Figure 4.1: Age of parents

Figure 4.1 indicates the age of parents who completed the online survey. Only 5% (7 out of 140) of the respondents who completed the survey were between the ages of 20-25. The majority of respondents (41.3%) were between the ages of 26-30 years, 28.57% were between 31-35 years of age and 13.57% between the age of 35-40 years. 11.43% of the respondents indicated that they were 40 years or older. According to Vittrup *et al*. (2016), it is important to take note of parents' ages when looking at young children's use of digital technology, as a lot of parents grew up with technology and thus, feel more comfortable and less frustrated using it. According to Marsden (2013), parents who experience less frustration whilst using digital technology are more inclined to allow their young children use digital technology.

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4.1.3 Q3: Please indicate your child's/children's age

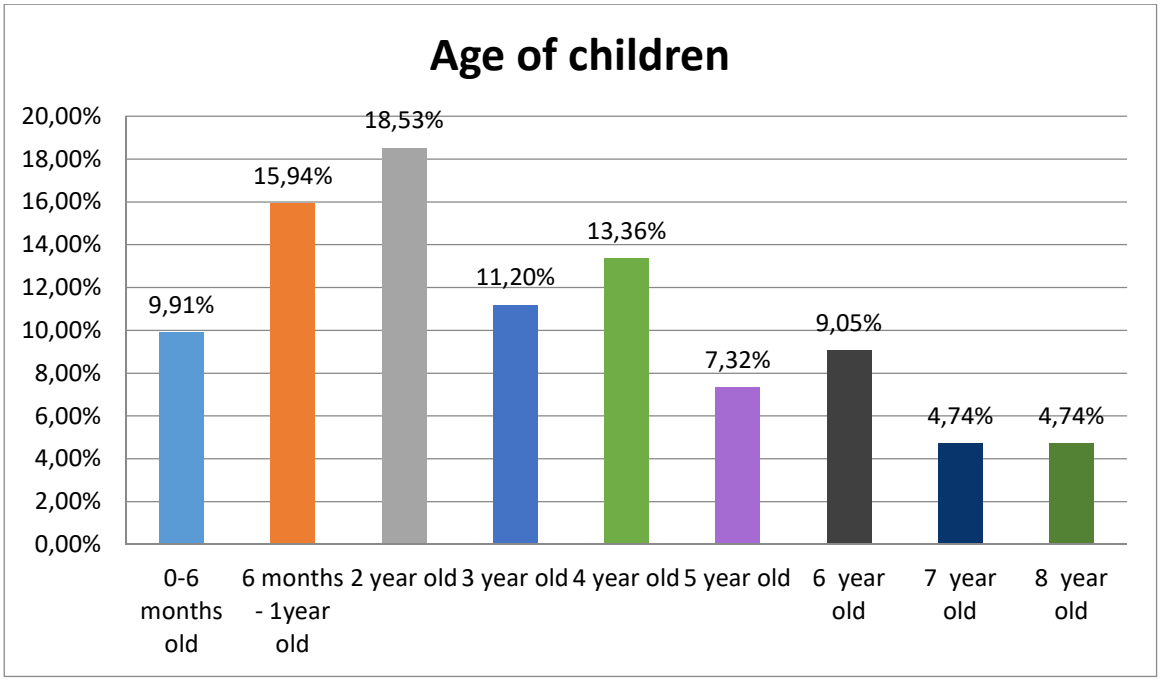

Figure 4.2: Age of children

Figure 4.2 indicates the different ages of all the children whose parents completed the online survey. As many as 44.38% of the children were 2 years old or younger, 31.88% were between the ages of 3 and 5 years and 18.53% were between the ages of 6 and 8 years. According to Malcom Gladwell, children today do not know a world without digital technology and that has profoundly shaped the way they see things (Menza, 2013).

4.4.4 Q4: How frequently do you use digital technology for reasons other than phone calls or email? Please choose one of the following:

Table 4.1: Frequency of the use of technology

Never	Very seldom	Monthly	Weekly	Daily
0.71%	3.57%	0.00%	5.7%	90%

Table 4.1 shows that 90% of the parents who responded to the survey use digital technology daily, for reasons other than phone calls or email. Only 0.71% of the respondents never use digital technology unless it is for phone calls or email, whereas 3.57% use digital technology very seldom. Nikken *et al*. (2015) found that parents who use digital technology often were more inclined to allow their young children use digital technology than parents who did not. Interestingly, 33.3% of the parents who chose the option 'never' or 'very seldom' in the online survey did not allow their children to use digital technology.

4.4.5 Q5: On a scale of 1 to 5 how often do you get frustrated whilst using digital technology? Please choose one of the following:

Table 4.2: **Frustration using technology**

Not at all 1	Somewhat 2	Moderately 3	A lot 4	Extremely 5
10.71%	35%	45%	6.43%	2.86%

Most respondents get frustrated with technology from time to time, but 6.43% of respondents indicated that they get frustrated a lot and 2.86% indicated that they get extremely frustrated whilst using digital technology. It is interesting to note that the parents who experienced either 'a lot of' or 'extreme' frustration, were from across all the age groups as shown in table 4.2. This suggests that even parents who grew up with technology got frustrated, not only the older parents as one might have expected. Marsden (2013) suggests that parents who experience frustration whilst using digital technology are more likely to restrict their children's use of digital technology than those who experience little or no frustration. My study found that even parents who did not get frustrated, still set limits on their children's use of digital technology. 84.62% of parents who got frustrated 'a lot' or 'extremely' limited the time their children spent on digital devices to 30 minutes daily, as opposed to 73.28% of parents who did not experience frustration (see Table 4.4).

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Table 4.3: Age of parents who got frustrated a lot or extremely whilst using digital technology

Age	Responses
20-25 years	0%
26-30 years	53.85%
31-35 years	23.08%
35-40 years	7.69%
<40 years	15.38%

Table 4.4: Time restrictions on children's use of digital technology according to the level of frustration experienced by parents

Parents who get frustrated a lot or extremely						
	Less than 15 min	15-30 min	30 min – 1 hour	1 hour- 2 hours	2-3 hours	More than 3 hours
Time children spend on digital technology	61.54%	23.08%	0%	7.69%	0%	7.69%
Parents who do not get frustrated a lot or at all						
	Less than 15 min	15-30 min	30 min – 1 hour	1 hour- 2 hours	2-3 hours	More than 3 hours
Time children spend on digital technology	66.67%	6.61%	26.67%	0%	0%	0%

The findings in the data below answer the following research question:

What do parents view as an appropriate age for their children to start using digital technology?

4.4.6 Q12: Please choose an age to complete the following sentence: Children should first be allowed to use digital technology at the age of .....?

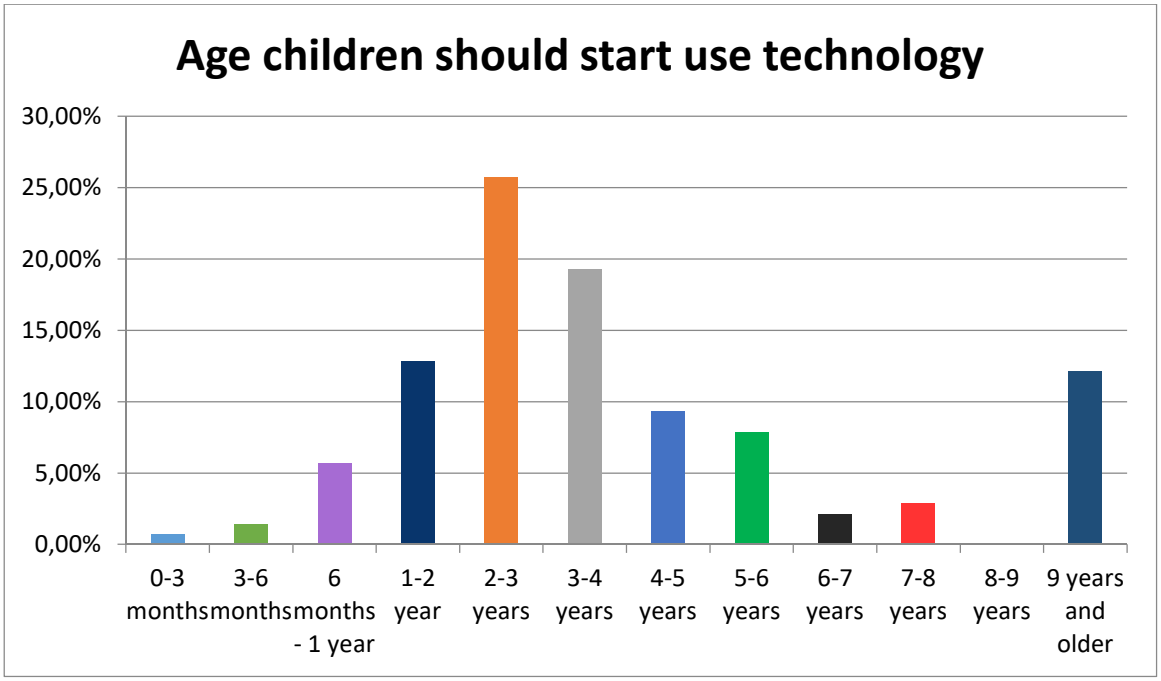

Figure 4.3: Age children should start to use digital technology

In Figure 4.3 it is clear that most parents tend to believe that children should not use digital technology before their first to second year. The majority of parents (25.71%) feel that children should only start using digital technology between the ages of 2 and 3 years, and 19.29% of parents believe that children should wait until they are 3 years old. Research shows that children should not use digital technology before the age of 2 years (American Academy of Pediatrics, 2001; Australian Department of Health, 2014).

The findings in the data below answer the following research question:
How do young children use digital technology?

4.4.7 Q6: Which of the following technologies does your child(ren) younger than 8 years of age use at home? Please choose one or more of the following:

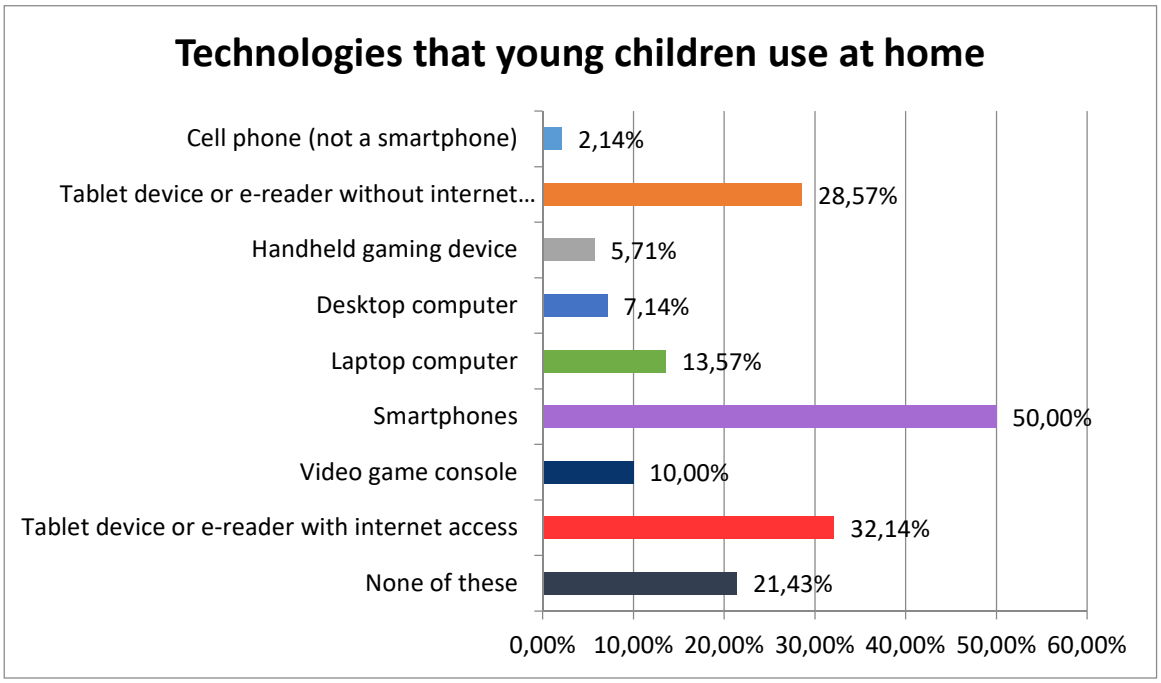

Figure 4.4: Technology devices that young children use at home

Figure 4.4 illustrates the different technologies that children between the ages of 0-8 use at home. The device most often used by children was a smartphone; according to a report done by Pew Research Center in 2015, 37% of the South African population owns a smartphone (Pew Research Center, 2017). 32.14% of children use tablet devices or e-readers with internet access and 28.57% of children use tablet devices or e-readers without internet access.

Table 4.5 shows the parent's age in correlation with technologies that young children use. It is clear that most parents, regardless of their age, do not allow their 0-6-month-old child use digital devices, although some parents did indicate that they allowed their 0-6-month-old child to use a smartphone and/or a tablet device. It is also clear from Table 4.5 that the older the children, the more devices they are allowed to use.

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Table 4.5: Technologies that young children use at home according to age

(* amount of respondents)

Parents between the ages of 20-25 years									
	Tablet device or e-reader with internet access	Video game console	Smart-phones	Laptop computer	Desktop computer	Handheld gaming device	Tablet device or e-reader without internet access	Cell phone (not a smart-phone)	None
0-6 months old *1	0%	0%	0%	0%	0%	0%	0%	0%	100%
6 months – 1year old *0	-	-	-	-	-	-	-	-	-
2 years old *3	0%	0%	33.33%	33.33%	0%	0%	66.67%	0%	0%
3 years old *1	100%	0%	0%	0%	0%	0%	100%	0%	0%
4 years old *0	-	-	-	-	-	-	-	-	-
5 years old *2	50%	0%	100%	50%	0%	0%	50%	0%	0%
6 years old *1	100%	0%	100%	100%	0%	0%	0%	0%	0%
7 years old *0	-	-	-	-	-	-	-	-	-
8 years old *0	-	-	-	-	-	-	-	-	-
Average	50%	0%	47%	37%	0%	0%	43%	0%	20%

Parents between the ages of 26-30 years									
	Tablet device or e-reader with internet access	Video game console	Smart-phones	Laptop computer	Desktop computer	Handheld gaming device	Tablet device or e-reader without internet access	Cell phone (not a smart-phone)	None
0-6 months old *15	0%	0%	20%	0%	0%	0%	6.66%	0%	80%
6 months – 1year old *19	5.26%	0%	31.57%	0%	0%	0%	5.26%	5.26%	57.89%
2 years old *22	18.18%	0%	59.09%	4.55%	4.55%	4.55%	22.73%	0%	27.8%
3 years old *8	25%	0%	75%	25%	0%	0%	25%	0%	12.50%
4 years old *9	11.11%	0%	44.44%	11.11%	0%	11.11%	33.33%	0%	33.33%
5 years old *1	0%	0%	0%	0%	0%	0%	0%	0%	100%
6 years old *3	0%	0%	66.67%	33.33%	0%	0%	66.67%	0%	0%
7 years old *1	0%	0%	100%	100%	0%	0%	0%	0%	0%
8 years old *2	100%	100%	50%	50%	0%	0%	0%	0%	0%
Average	18%	11%	50%	25%	1%	2%	18%	1%	35%

Parents between the ages of 31-35 years									
	Tablet device or e-reader with internet access	Video game console	Smart-phones	Laptop computer	Desktop computer	Handheld gaming device	Tablet device or e-reader without internet access	Cell phone (not a smart-phone)	None
0-6 months	0%	0%	0%	0%	0%	0%	16.66%	0%	83.33%

old *6									
6 months – 1year old *12	0%	0%	25%	0%	0%	0%	0%	0%	75%
2 years old *13	38.46%	7.69%	46.15%	15.38%	7.69%	0%	46.15%	0%	0%
3 years old *9	44.44%	0%	33.33%	11.11%	0%	0%	33.33%	11.11%	11.11%
4 years old *11	27.27%	18.18%	63.64%	18.18%	0%	9.09%	45.45%	0%	0%
5 years old *7	57.14%	14.29%	28.57%	0%	14.29%	0%	14.29%	0%	0%
6 years old *7	73.43%	57.14%	57.14%	71.63%	14.29%	28.57%	57.14%	14.29%	0%
7 years old *2	50%	50%	50%	50%	0%	0%	50%	0%	0%
8 years old *1	0%	0%	0%	100%	0%	0%	100%	0%	0%
Average	32%	16%	34%	30%	4%	4%	40%	3%	19%

Parents between the ages of 36-40 years

	Tablet device or e-reader with internet access	Video game console	Smart-phones	Laptop computer	Desktop computer	Handheld gaming device	Tablet device or e-reader without internet access	Cell phone (not a smart-phone)	None
0-6 months old *1	0%	0%	0%	0%	0%	0%	0%	0%	100%
6 months – 1year old *4	0%	0%	25%	0%	0%	0%	0%	0%	75%
2 years old	50%	50%	50%	50%	0%	0%	50%	0%	0%

*2									
3 years old *4	75%	25%	50%	0%	50%	25%	25%	0%	0%
4 years old *6	50%	0%	33.33%	0%	0%	16.77%	16.67%	0%	33.33%
5 years old *5	20%	0%	60%	20%	0%	20%	20%	0%	0%
6 years old *5	80%	20%	60%	0%	40%	0%	0%	0%	0%
7 years old *4	50%	0%	75%	0%	50%	0%	25%	0%	0%
8 years old *6	83.33%	33.33%	66.67%	16.67%	33.33%	0%	16.67%	0%	0%
Average	45%	14%	47%	10%	19%	7%	17%	0%	23%

Parents between the ages of <40 years

	Tablet device or e-reader with internet access	Video game console	Smart-phones	Laptop computer	Desktop computer	Handheld gaming device	Tablet device or e-reader without internet access	Cell phone (not a smart-phone)	None
0-6 months old *0	-	-	-	-	-	-	-	-	-
6 months – 1year old *1	0%	0%	0%	0%	0%	0%	0%	0%	100%
2 years old *3	0%	0%	66.67%	0%	33.33%	33.33%	0%	33.33%	0%
3 years old *4	25%	0%	50%	0%	25%	25%	75%	25%	0%
4 years old *5	60%	0%	40%	0%	40%	20%	40%	20%	0%
5 years	50%	0%	0%	50%	50%	50%	0%	50%	0%

old *2									
6 years old *5	20%	40%	80%	0%	0%	20%	100%	0%	0%
7 years old *4	25%	25%	25%	0%	50%	50%	75%	25%	0%
8 years old *2	0%	50%	100%	0%	50%	50%	100%	0%	0%
Average	23%	14%	45%	6%	31%	31%	49%	19%	13%

4.4.8 Q7: How much time does your child, younger than 8 years of age spend on digital devices, such as smartphones, computer, tablets etc. daily? Please choose one of the following:

Table 4.6: Time children spend on digital devices

(* amount of respondents)

Parents between the ages of 20-25 years						
	Less than 15 min	15-30 min	30 min – 1hour	1 hour -2 hours	2-3 hours	More than 3 hours
0-6 months old *1	100%	0%	0%	0%	0%	0%
6 months – 1year old *0	-	-	-	-	-	-
2 years old *3	0%	66.66%	0%	33.33%	0%	0%
3 years old *0	-	-	-	-	-	-
4 years old *0	-	-	-	-	-	-

5 years old *2	0%	50%	0%	50%	0%	0%
6 years old *1	0%	0%	100%	0%	0%	0%
7 years old *0	-	-	-	-	-	-
8 years old *0	-	-	-	-	-	-
Average	25%	29%	25%	21%	0%	0%

Parents between the ages of 26-30 years						
	Less than 15 min	15-30 min	30 min – 1hour	1 hour -2 hours	2-3 hours	More than 3 hours
0-6 months old *15	100%	0%	0%	0%	0%	0%
6 months – 1year old *19	100%	0%	0%	0%	0%	0%
2 years old *22	61.68%	28.76%	9.52%	0%	0%	0%
3 years old *8	50%	37.50%	12.50%	0%	0%	0%
4 years old *9	37.50%	37.50%	25%	0%	0%	0%
5 years old *1	100%	0%	0%	0%	0%	0%
6 years old *3	33.33%	66.67%	0%	0%	0%	0%
7 years old *1	100%	0%	0%	0%	0%	0%

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8 years old *2	0%	0%	50%	0%	50%	0%
Average	65%	19%	11%	0%	6%	0%

Parents between the ages of 31-35 years

	Less than 15 min	15-30 min	30 min – 1hour	1 hour -2 hours	2-3 hours	More than 3 hours
0-6 months old *6	100%	0%	0%	0%	0%	0%
6 months – 1year old *12	100%	0%	0%	0%	0%	0%
2 years old *13	30.77%	30.77%	23.08%	7.69%	0%	0%
3 years old *9	44.44%	33.33%	11.11%	11.11%	0%	0%
4 years old *11	45.45%	0%	27.27%	18.18%	9.09%	0%
5 years old *7	28.57%	57.14%	14.29%	0%	0%	0%
6 years old *7	28.57%	0%	42.86%	14.29%	14.29%	0%
7 years old *2	50%	0%	50%	0%	0%	0%
8 years old *1	100%	0%	0%	0%	0%	0%
Average	59%	13%	19%	6%	3%	0%

Parents between the ages of 36-40 years

	Less than	15-30 min	30 min –	1 hour -2	2-3 hours	More than 3

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	15 min		1hour	hours		hours
0-6 months old *1	100%	0%	0%	0%	0%	0%
6 months – 1year old *4	100%	0%	0%	0%	0%	0%
2 years old *2	50%	0%	0%	0%	50%	0%
3 years old *4	0%	50%	25%	25%	0%	0%
4 years old *6	33.33%	33.33%	33.33%	0%	0%	0%
5 years old *5	40%	60%	0%	0%	0%	0%
6 years old *5	20%	20%	60%	0%	0%	0%
7 years old *4	25%	50%	0%	25%	0%	0%
8 years old *6	16.67%	16.67%	50%	0%	16.67%	0%
Average	43%	26%	19%	6%	7%	0%

Parents between the ages of <40 years

	Less than 15 min	15-30 min	30 min – 1hour	1 hour -2 hours	2-3 hours	More than 3 hours
0-6 months old *0	-	-	-	-	-	-
6 months – 1year old *1	100%	0%	0%	0%	0%	0%

2 years old *3	66.67%	0%	33.33%	0%	0%	0%
3 years old *4	25%	25%	25%	25%	0%	0%
4 years old *5	40%	20%	40%	0%	0%	0%
5 years old *2	50%	0%	50%	0%	0%	0%
6 years old *5	20%	20%	0%	40%	0%	20%
7 years old *4	25%	50%	25%	0%	0%	0%
8 years old *2	0%	50%	0%	50%	0%	0%
Average	41%	21%	22%	14%	0%	3%

Table 4.6 shows that all the parents, regardless of their age, with children between the ages of 0 to 1 year, do not allow their child to spend more than 15 minutes daily on any given digital device. The Australian and United States policy makers recommend that two to five year old children spend only one hour per day using digital technology and children older than five a maximum of one to two hours per day. However according to Neumann (2015), research has shown that pre-school children are exceeding these recommended screen time guidelines, especially since the release of touchscreen tablets. My research showed that some parents do indeed let their children use digital devices for longer than what was recommended by the Australian and United States policy makers.

Table 4.6 shows that 33.33% of the parents in the age group of 20-25 years allow their 2-year-old children to spend up to 2 hours daily on a digital device and 50% allow their 5-year-old children up to 2 hours daily on a digital device. None of the parents in the age group of 26-30 years allow their children between the ages of 2-5 years to spend more than one hour

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daily on a digital device. 7.69% of the 2-year-old children of the parents in the age group of 31-35 are allowed to use a digital device for up to 2 hours daily, whereas 11.11% of the 3-year-olds and 18.18% of the 4-year-olds are allowed 2 hours daily. 9.09% of the 4-year-olds are allowed up to 3 hours daily on a digital device. None of the 5-year-old children are allowed to use a digital device for more than an hour daily. 50% of the parents in the age group of 36-40 years indicated that their 2-year-old spent up to 2 hours daily on a digital device, none of the other age groups up to 5 years are allowed more than 1 hour daily. All the parents older than 40 indicated that their children between the ages of 2-5 years are not allowed to spend more than an hour on a digital device daily.

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4.4.9 Q8: Please indicate what your child(ren) use digital technologies for. Please choose one or more of the following:

Table 4.7: What children use technology for

(* amount of respondents)

Parents between the ages of 20-25 years								
	Reading stories	Watching stories	Singing songs	Playing games	Playing educational games	Painting	Drawing	My child does not use technology
0-6 months old *1	0%	0%	0%	0%	0%	0%	0%	100%
6 months – 1year old *0	-	-	-	-	-	-	-	-
2 years old *3	33.33%	66.66%	66.66%	100%	66.66%	0%	33.33%	0%
3 years old *1	0%	0%	0%	100%	100%	100%	100%	0%

4 years old *0	-	-	-	-	-	-	-	-
5 years old *2	0%	0%	50%	100%	0%	0%	50%	0%
6 years old *1	100%	100%	100%	100%	100%	100%	100%	0%
7 years old *0	-	-	-	-	-	-	-	-
8 years old *0	-	-	-	-	-	-	-	-
Average	27%	33%	43%	80%	53%	40%	57%	20%

Parents between the ages of 26-30 years

	Reading stories	Watching stories	Singing songs	Playing games	Playing educational games	Painting	Drawing	My child does not use technology
0-6 months old *15	6.66%	33.33%	20%	0%	6.66%	0%	0%	60%
6 months – 1year old *19	5.26%	31.57%	26.31%	5.26%	10.52%	5.26%	5.26%	42.10%
2 years old *22	12.18%	68.18%	45.45%	36.37%	59.1%	13.64%	13.64%	0%
3 years old *8	0%	62.50%	0%	50%	62.50%	12.50%	25%	0%
4 years old *9	33.33%	33.33%	22.22%	44.44%	44.44%	33.33%	22.22%	22.22%
5 years old *1	0%	0%	0%	0%	0%	0%	0%	100%
6 years	0%	0%	0%	33.33%	100%	0%	0%	0%

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old *3								
7 years old *1	0%	0%	100%	0%	100%	0%	0%	0%
8 years old *2	50%	50%	0%	100%	50%	0%	50%	0%
Average	12.%	31.%	24%	30%	48%	7%	13%	24%

Parents between the ages of 31-35 years								
	Reading stories	Watching stories	Singing songs	Playing games	Playing educational games	Painting	Drawing	My child does not use technology
0-6 months old *6	0%	16.66%	0%	0%	0%	0%	16.16%	83.33%
6 months – 1year old *12	0%	8.33%	25%	0%	8.33%	0%	0%	66.66%
2 years old *13	23.08%	46.16%	38.46%	38.46%	76.93%	30.77%	38.46%	0%
3 years old *9	22.22%	55.56%	22.22%	22.22%	44.44%	11.11%	33.33%	11.11%
4 years old *11	9.09%	72.73%	27.27%	45.45%	63.64%	27.27%	36.36%	0%
5 years old *7	14.29%	14.29%	42.86%	28.57%	71.43%	28.57%	42.86%	0%
6 years old *7	52.14%	85.71%	42.86%	71.43%	57.14%	57.14%	71.43%	0%
7 years old *2	0%	100%	0%	50%	100%	50%	50%	0%
8 years old	100%	100%	100%	100%	100%	100%	100%	0%

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*1								
Average	25%	55%	33%	40%	58%	34%	43%	18%

Parents between the ages of 36-40 years

	Reading stories	Watching stories	Singing songs	Playing games	Playing educational games	Painting	Drawing	My child does not use technology
0-6 months old *1	0%	0%	0%	0%	0%	0%	0%	100%
6 months – 1year old *4	0%	50%	25%	0%	25%	25%	0%	50%
2 years old *2	50%	100%	0%	50%	50%	100%	50%	0%
3 years old *4	25%	75%	50%	50%	25%	0%	0%	0%
4 years old *6	66.67%	66.67%	50%	33.33%	83.83%	16.67%	16.67%	16.67%
5 years old *5	0%	25%	50%	75%	75%	0%	0%	0%
6 years old *5	40%	100%	20%	60%	20%	40%	40%	0%
7 years old *4	25%	50%	25%	25%	75%	25%	0%	0%
8 years old *6	66.67%	100%	16.67%	83.33%	50%	33.33%	33.33%	0%
Average	30%	63%	26%	42%	45%	27%	16%	19%

Parents between the ages of <40 years

	Reading stories	Watching stories	Singing songs	Playing games	Playing educational	Painting	Drawing	My child does not

					games			use technology
0-6 months old *0	-	-	-	-	-	-	-	-
6 months – 1year old *1	0%	0%	0%	0%	0%	0%	0%	100%
2 years old *3	0%	33.33%	0%	66.67%	66.67%	0%	0%	0%
3 years old *4	25%	100%	75%	25%	75%	25%	25%	0%
4 years old *5	20%	80%	20%	40%	80%	20%	20%	0%
5 years old *2	50%	100%	50%	100%	100%	50%	50%	0%
6 years old *5	0%	40%	40%	60%	80%	20%	20%	0%
7 years old *4	25%	0%	25%	100%	25%	25%	50%	0%
8 years old *2	50%	50%	50%	100%	50%	0%	50%	0%
Average	21%	50%	33%	61%	60%	18%	27%	13%

Table 4.7 indicates that an average of 18.98% of children between the ages of 0 and 8 were not allowed to use digital technology. 85.83% of parents with children aged 0 - 6 months indicated that their children did not use digital technology. 64.69% of the parents with children ranging from the age of 6 months to 1 year did not allow their children to use digital technology. This could be due to research showing that children should rather not use digital technologies before the age of 2 years (American Academy of Pediatrics, 2001; Australian Department of Health, 2014). Children that are allowed to use digital technology between the

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ages of 0 and 1 year used it for activities such as reading stories, watching stories, singing songs, playing educational games and drawing.

Most children (52.82%) between the ages of 0 and 8 years use digital technologies for playing educational games. According to Linn *et al*. (2012), watching stories such as fast paced cartoon shows can be negative for children, yet 46.39% of children use digital devices to watch stories, as can be seen in Table 4.7. It is clear that parents from all age groups allow their young children to use digital technology for various reasons, see Table 4.8. Parents also indicated that digital devices were used for taking photos, browsing through photos, recording videos, watching recorded videos, listening to animal sounds and listening to music.

Table 4.88: Young children's use of digital technology compared to parent's ages:

Parents age	Reading stories	Watching stories	Singing Songs	Playing games	Playing educational games	Painting	Drawing	My child does not use digital technology
20-25 years	27%	33%	43%	80%	53%	40%	57%	20%
26-30 years	12%	31%	24%	30%	48%	7%	13%	24%
31-35 years	25%	55%	33%	40%	58%	34%	43%	18%
36-40 years	30%	63%	26%	42%	45%	27%	16%	19%
<40	21%	50%	%33	61%	60%	18%	27%	13%

The findings in the data below answer the following research question:

What are the educational advantages and disadvantages of young children using digital technology?

4.4.10 Q11: Which statement do you agree with more? Please choose one of the following:

Table 4.99: Technology and educational development

Today's technology can help young children (0-8) with educational development	60.00%
Today's technology can harm young children (0-8) educational development	26.43%
Not sure	13.57%

Table 4.9 indicates that 60% of parents agree with the statement that today's technology can be helpful rather than harmful with regard to young children's educational development, whereas 26.43% disagree and perceive it to be more harmful than helpful. Ofcom (2014) also found that the majority of parents (53%) feel that their child will potentially benefit more from using digital devices than being harmed by them. Chau (2014) argues that a developmentally meaningful application has to adhere to three conditions: (1) the application must be designed to accommodate the developmental stages and needs of young children; (2) the content must be designed to promote young children's development in areas such as cognition, academic skills, social skills and physical development; and (3) the application should engage children in activities and behaviours that foster optimal developmental assets.

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4.4.11 Q13: How much do you agree with the following statement?

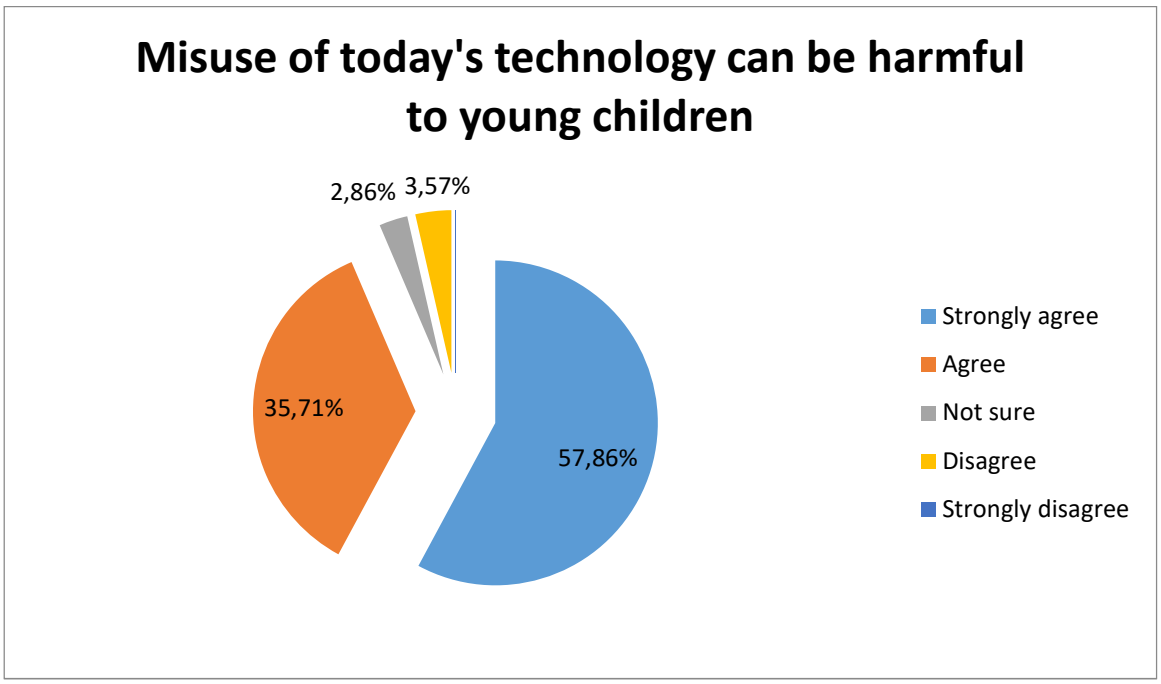

Figure 4.5: Misuse of today's technology can be harmful to young children

Figure 4.5 indicates how strongly parents agree or disagree with the notion that misuse of today's technology can be harmful to young children's development. Interestingly none of the parents strongly disagreed, only 3.57% disagreed, whereas 57.86% strongly agreed and 35.71% agreed. A small proportion of parents (2.86%) were unsure. This shows that most parents are aware that technology can be misused and that it can consequently have a negative impact on their children.

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4.4.12 Q14: Appropriate use of today's technology can enhance my child's development. Please choose one of the following:

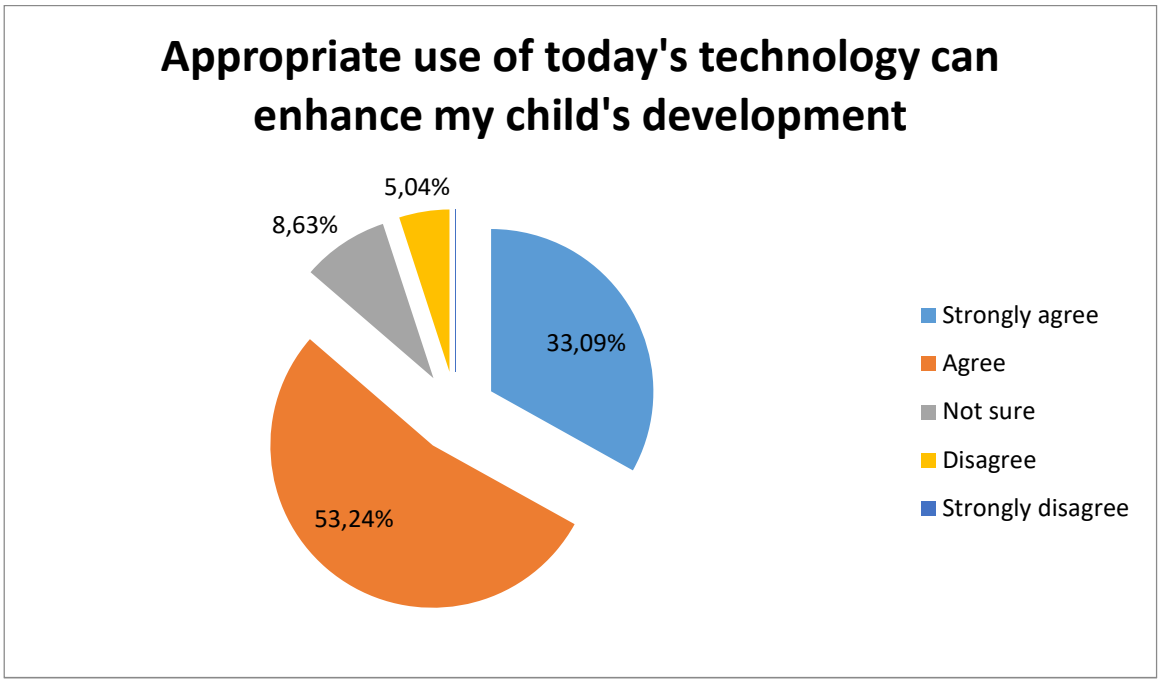

Figure 4.6: Appropriate use of today's technology can enhance my child's development

By far the majority of parents agree that appropriate use of today's technology can enhance children's development. 53,24% agreed, 33.09% strongly agreed and a mere 5.04% of the parents disagreed as shown in Figure 4.6. None of the parents strongly disagreed and 8.63% of the parents were unsure. In their 2016 study, Vittrup *et al*. found that 32.6 % of parents felt that technology exposure to young children (0-3) is important for early brain development.

4.4.13 Q15: Technology will enhance my child's/children's speech and language skills. Please choose one of the following:

Table 4.10 Digital technology and speech and language skills

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
17.27%	40.29%	17.27%	20.86%	4.32%

Table 4.12 shows that the majority of parents (40.29%) agree that technology will enhance their child's speech and language skills, 17.27% of the parents strongly agree and 20.86% disagree. A total of 4.32% of parents strongly disagree with that notion and 17.27% were unsure. Paddock (2011) conducted a report where it was mentioned that television and other media can cause delayed language development in young children. In contrast McPake *et al.* (2013) found that children as young as 9 months who could only babble, would try to mimic "talk" when playing a cell phone – a clear sign of communication and language development. The American Speech-Language-Hearing Association (2015) found in their study that 66% of parents felt that young children's communication skills can be enhanced through appropriate use of digital technology.

4.4.14 Q16: Because of technology, I have fewer conversations with my child(ren) than I would like. Please choose one of the following:

Table 4.10: Digital technologies causing fewer conversations with parents

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
7.19%	30.22%	7.91%	35.25%	19.42%

Table 4.10 shows that the majority (54.67%) of parents did not agree with the statement that digital technology causes fewer conversations between them and their children. 37.41% of

the parents agreed with the statement. The American Speech-Language-Hearing Association (2015) found in their study that 72% of parents felt that technology is actually the cause for better communication between them and their young children.

4.4.15 Q17: My child(ren) would be disadvantaged if he or she is not allowed to partake in any activities involving technological devices. Please choose one of the following:

Table 4.11: **If children do not use digital technology they will be disadvantaged**

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
12.23%	48.20%	12.23%	23.74%	3.60%

The majority (60.43%) of parents agree that their children would be disadvantaged it they were not allowed to use digital technology, see Table 4.11. 27.34% of parents disagreed with that notion, and 12.23% of parents felt unsure. In another study it was found that 32.7% of parents felt that their child would fall behind academically if they were restricted from using digital technology (Vittrup *et al*., 2016).

4.4.16 Q21: How beneficial do you think digital technology can be in the following developmental areas?

Table 4.12: Technology can be beneficial in the following developmental areas

	A lot	Somewhat	Not sure	Not a lot	Not at all	Harmful
Social development	9.29%	22.86%	5.00%	27.14%	15.00%	20.71%
Language development	31.43%	42.14%	5.71%	12.86%	3.57%	4.29%
Mathematics	50.00%	34.29%	7.86%	5.00%	1.43%	1.43%
Problem solving	45.71%	31.43%	8.57%	7.86%	4.29%	2.14%

Fine motor skills	17.86%	37.86%	12.14%	15.00%	10.71%	6.43%

As can be seen in Table 4.12, parents do not believe digital technologies are equally beneficial in all of their children's important developmental areas. 20.71% of parents felt that technology cannot be beneficial for social development, whereas 9.29% of parents felt that technology can benefit a child's social development a lot. 45.71% of parents felt that technology can benefit their child's problem solving skills, and 50% of parents felt that it can benefit their child's mathematics skills. According to Paddock (2011), there are a lot of products being marketed as 'educational' for toddlers and babies, but there is no evidence to support the notion that they are indeed educational or can help enhance development.

The findings in the data below answer the following research question:
What are the roles and responsibilities of parents regarding young children's use of technological devices?

4.4.9 Q9: Do you set limits on your child's/ children's use of digital technology eg. watching or playing time? Please choose one of the following:

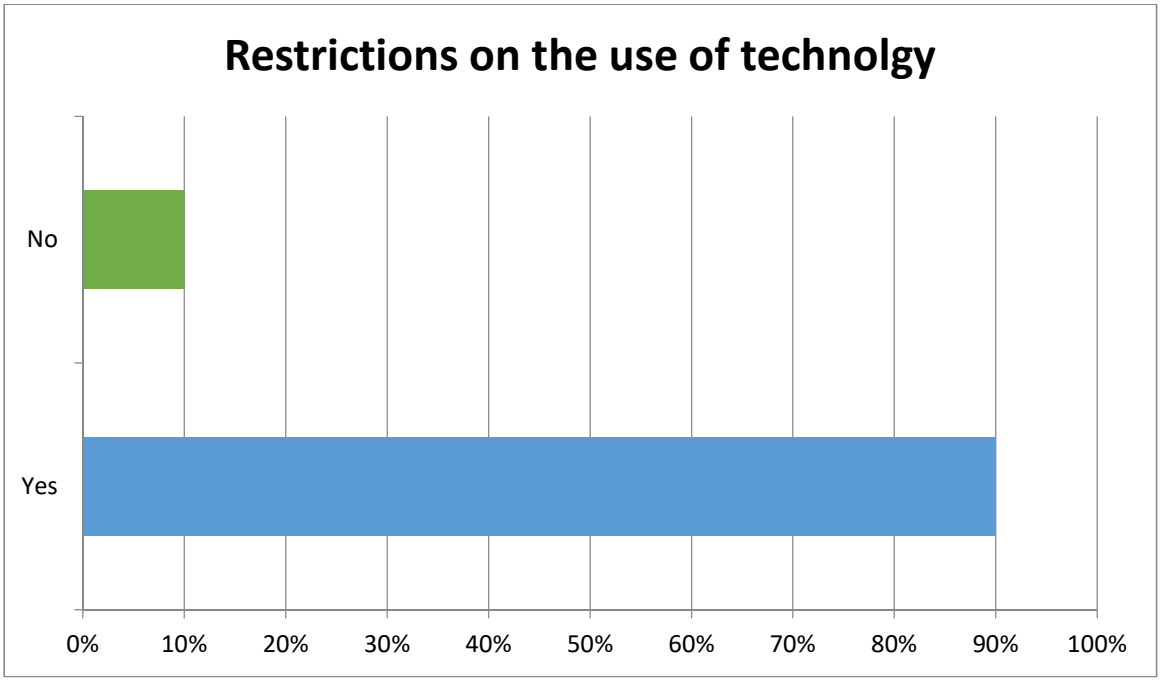

Figure 4.7: Children's restrictions on the use of technology

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Most parents (90%) place restrictions on their child's/children's use of digital technology. As can be seen in figure 4.7, only 10% of parents do not set limits at all. Parents from all age groups place limits on to their children's use of digital technology as can be seen from figure 4.8. Marsden (2013) suggested that parents who experience frustration whilst using digital technology are more inclined to limit their young children's use of digital technology, but I found that most parents set at least some limits with regard to their children's use of digital technology, regardless of their frustration level (see Table 4.13 and 4.14).

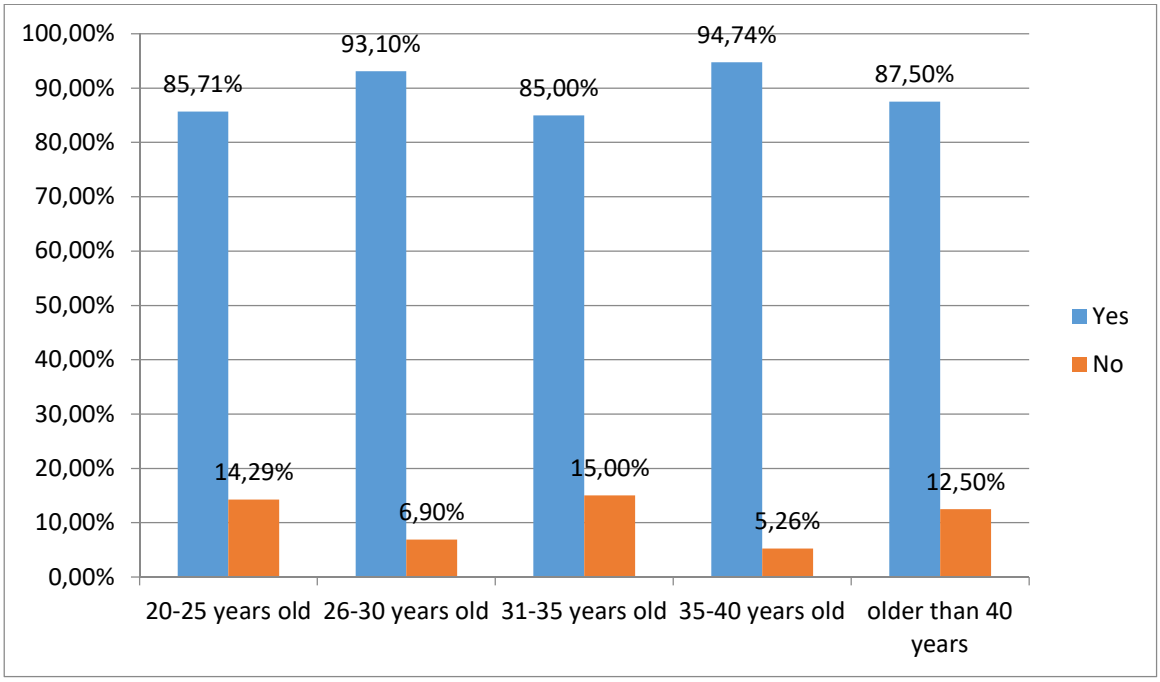

Figure 4.8: Parent's age and children's limits on the use of technology

Table 4.13: Level of frustration of parents who set limits

	Not at all	Somewhat	Moderate	A lot	Extremely
20-25 years old	0%	66.76%	33.33%	0%	0%
26-30 years old	3.70%	31.48%	51.85%	9.26%	3.7%
31-35 years old	17.65%	32.35%	41.18%	5.88%	2.94%
36-40 years old	11.11%	55.56%	27.78%	5.56%	0%

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older than 40 years	21.43%	28.57%	42.86%	7.14%	0%
Average	11%	43%	39%	6%	1%

Table 4.14: Level of frustration of parents who do not set limits

	Not at all	Somewhat	Moderate	A lot	Extremely
20-25 years old	0%	0%	100%	0%	0%
26-30 years old	0.00%	50%	50%	0%	0%
31-35 years old	16.67%	16.67%	66.67%	0%	0%
36-40 years old	0%	0%	100%	0%	0%
older than 40 years	50%	0%	0%	0%	50%
Average	13%	13%	63%	0%	10%

4.4.10 Q10: To what extent do you believe it is your responsibility to supervise your child(ren) whilst they use digital technologies? Please choose one of the following:

Table 4.15 Parent's responsibility to supervise their children whilst using digital technology

Not at all	Less than 10%	10-30%	30-50%	50-70%	70-90%	More than 90%
0.71%	0.00%	1.43%	1.43%	5.71%	13.57%	77.14%

The majority of parents (77.14%) rated their responsibility to supervise their children whilst they use digital technology at 90% or more (see Table 4.15). Only 0.71% of parents do not feel any responsibility in this regard. Parents can be seen as the main gatekeepers regarding their children's use of technology (O'Conner *et al.*, 2016 and Nikken *et al.*, 2015). With regard to young children's media use, this means that when the child is engaged in specific media activities, the parent should apply a form of mediation that is developmentally appropriate (Schofield, 2011). Furthermore, parents who are less skilled in using media

themselves may find it more difficult to install parental controls on the devices, or to discuss the media content critically with their children as compared to media-literate parents (De Haan, 2010).

4.4.18 Q18: The technology industry should help educate the public about using technology safely. Please choose one of the following:

Table 4.16: The technology industry should educate parents

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
43.88%	50.36%	4.32%	1.44%	0.00%

According to the survey data, the overall feeling of parents is that the technology industry should help educate the public to use technology safely with 43.88% of parents strongly agreeing and 50.36% of parents agreeing, see Table 4.16. Similar results were found in a study conducted by The American Speech-Language-Hearing Association (2015), where 75% of parents felt that the technology industry has an obligation to educate the public about safe technology use.

4.4.19 Q19: The technology industry is doing what it should to help educate the public about using technology safely. Please choose one of the following:

Table 4.17: Technology industry is educating the public about safe use of technology

Age of parents	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
20-25 years	71.43%	28.57%	0%	0%	0%
26-30 years	51.72%	43.10%	5.17%	0%	0%
31-35 years	38.46%	61.54%	0%	0%	0%

36-40 years	21.05%	63.16%	5.26%	10.53%	0%
<40 years	43.75%	43.75%	12.50%	0%	0%

The American Speech-Language-Hearing Association (2015) found in their study that 41% of parents agreed/strongly agreed that the technology industry is doing what it should to educate the public about safe technology use. Interestingly, from of a South African point of view only 9.28% of parents agree or strongly agree with that statement as shown in Table 4.17.

4.4.20 Q20: It is hard to stay current with news about how misuse of technology may impact my child's/ children's development. Please choose one of the following:

Table 4.18: It is hard to stay current with news regarding the impact of misuse of technology

Age of parents	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
20-25 years	0%	0%	42.86%	42.86%	14.29%
26-30 years	3.45%	3.45%	31.03%	50%	12.07%
31-35 years	5%	10%	35%	42.50%	7.50%
36-40 years	5.26%	10.53%	26.32%	47.37%	10.53%
<40 years	0%	0%	37.56%	43.75%	18.75%

Although 55% of parents agreed or strongly agreed that it is hard to keep up with news regarding how to use technology safely, Table 4.18 shows that 1 out of every 4 parents felt that they are able to keep abreast with the news on the negative influence that technology may have on their children. American Speech-Language-Hearing Association (2015) found in their study that 37% of parents agree or strongly agree.

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CHAPTER 5 FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

In Chapter 5 a conclusion of the research study is presented. The limitations of the study are also discussed. The research questions mentioned in Chapter 1 are addressed and answered. Findings, recommendations, ideas for further research and final thoughts are given.

5.2 SYNOPSIS OF CHAPTERS

CHAPTER 1

In Chapter 1 an introduction to the study was given. In this chapter the reader was provided with the reason this study was done and insight was given into the specific field of research. The chapter was underpinned by the background of the study, rationale of the study, problem statement, the purpose of the study, research assumptions and an overview of the literature review.

CHAPTER 2

Chapter 2 formed a very important part of this study. In this chapter relevant literature was reviewed, focusing on the specific research questions of the study. A conceptual framework followed the literature review, aiding the data collection process.

CHAPTER 3

This chapter described the research design and methodology that was used. A deterministic philosophy was followed within a post-positivist paradigm. The research was quantitative with a non-experimental research design through the use of an online survey, distributed through multiple social media platforms such as Facebook, Twitter, LinkedIn and Pinterest. The underlying approach in this research was quantitative with a non-experimental research design through the use of an online survey.

CHAPTER 4

The results describing how parents experience young children's use of digital technology for learning at home were presented in this chapter. The results of each question asked in the online survey were presented and discussed.

CHAPTER 5

Chapter 5 concludes the research study by providing answers to the research questions. Limitations, findings, suggestions, recommendations and final thoughts are also presented in order to conclude this research study.

5.3 LIMITATIONS OF THE STUDY

5.3.1 My survey was distributed online through the use of social media such as Twitter, Facebook, Pinterest and LinkedIn. Parents thus had to have access to the internet to partake in the study.

5.3.2 Another limitation of the study was to try and get participants interested in the topic so that they would feel compelled to share it with their contacts.

5.3.3 My contacts on Facebook got saturated fairly quickly, I thus needed to establish more contacts to share the post with and also had to rely on people sharing the post.

5.3.4 A lot of the targeted audience often missed my posts that I made on the social media platforms, this can be due to the fact that people have too many new posts on their newsfeed.

5.3.5 A lot of my contacts did not respond to the survey immediately, and in most of these cases I found that they then forgot to complete the survey.

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5.4 ADDRESSING LIMITATIONS

5.4.1 I used Survey Monkey, a web-based survey solution to distribute my questionnaire. Survey Monkey allows participants to complete the survey on any device that has access to the internet, parents could thus complete the survey for example on their smartphone or tablet.

5.4.2 To address the issue of getting participants interested in the topic, I created a group on Facebook called "Young children and the use of technology". In this group I published relevant information regarding young children and the use of technology, focusing on both the positive and negative effects that technology can have on young children.

5.4.3 I used Facebook's "Boost Post" option, where you can choose a specific audience you want to reach. Facebook then shares your page or post with that specific audience, the audience does not need to be part of your contacts.

5.4.4 I only posted between the hours of 6pm and 9pm, as I found that most of my audience worked during the day. All the participants had young children so they often only get a chance to go on social media whilst cooking dinner or after putting their children to bed. I also targeted specific contacts that I knew had young children or would be willing to share the post with other parents with young children. It was important to send a private message to these contacts and to personally ask them to please complete or share the survey, rather than just 'blindly' sharing the post on, for example, my Facebook wall.

5.4.5 I sent a reminder post to remind parents to please complete the survey and to please share it with other parents. I also send out a "Last chance to complete the survey" post before I closed the survey.

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5.5 ANSWERING RESEARCH QUESTIONS

In order to answer the main research question, the sub- questions are answered first.

5.5.1 Sub-Question 1:

What do parents view as an appropriate age for their children to start using digital technology?

It is clear from the research that although some parents allow their young children to use digital technology from as early as 6 months, the majority of parents feel that the most appropriate age for a child to start using digital technology is between the ages of two and three years. 39.13% of children between 0 and 6 months were not allowed to use digital technology at all.

5.5.2 Sub-Question 2:

How do young children use digital technology?

The majority of children used smartphones and tablet or e-reader devices at home. The research showed that the majority of children use digital technologies mainly for watching programs and playing games, including educational games. Interestingly only 13.94% of parents indicated that their children were not allowed to use digital technology at all, 39.13% of those children were between the ages of 0-6 months. Parents with children between the ages of 0-2 years also indicted that they let their children use digital technology to listen to stories, record videos, watch recorded videos and to sing songs or listen to music.

Almost all off the parents indicated that their child/children were not allowed to spend more than 3 hours a day on digital devices. The majority of parents allowed their child/children to spend up to one hour on a digital device daily, 31.21% of parents only allowed 15 minutes. The research clearly shows that the younger the child is, the less time he/she is allowed to spend on digital devices.

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5.5.3 Sub-Question 3:

What are the educational advantages and disadvantages of young children using digital technologies?

For technology to be beneficial it is necessary to know how the specific technology works (Zevenbergen, 2007). When children use digital technologies too extensively problems such as childhood obesity, sleep disturbance, learning problems, attention problems and social problems may occur (Linn *et al*., 2012). Wood *et al*. (2016) is of the opinion that the rapid advancement in the development in digital devices such as mobile devices has led to better software programs, designed to promote exploration, discovery, play and development of skills relating to cognitive and social development. When digital technology is used appropriately it can also be beneficial for speech and language development, (McPake *et al*., 2013, Zevenbergent, 2007). Digital technology not only stimulates children's visual, auditory, tactile and kinesthetic sensory systems, but also provides immediate feedback. Children are thus enabled to grasp the technology quickly and explore new things, learn new skills and gain more knowledge (Wood *et al*., 2016).

According to the survey research done, South African parents felt that digital devices were more beneficial than harmful when it came to language development, mathematical development, problem solving and fine motor skills; but potentially more harmful than beneficial when it came to social development. 60.43% of parents agreed that their child/children would be disadvantaged if they are not allowed to partake in any activities involving technological devices.

5.5.4 Sub-Question 4:

What are parents feelings regarding their own responsibility and that of the technology industry regarding the use of technology by young children?

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A parent's role in establishing positive outcomes regarding young children and their use of digital technology cannot be emphasized enough (Radesky *et al*., 2015). Linn *et al*. (2012) believe that learning cannot take place if a parent is not actively involved whilst their young child uses digital technology. By being actively involved, a parent gives a child not only verbal support but also emotional-verbal, physical and emotional-physical support (Wood *et al*. 2016). If a parent is absent whilst his/her child uses digital technology, the child may become addicted and require therapy later on (Ward, 2013). Children can also download inappropriate content if a parent is absent, it is thus important for parents to keep tabs on what their children do if they have any digital devices that are connected to the internet. Parents can also make use of technical restrictions, such as the 'parental control' features provided by media devices to regulate or block inappropriate content (Livingstone *et al*., 2008).

90% of the respondents in the survey study limited their child's/children's use of digital technology. The study also found that the majority of parents felt that it was their responsibility to supervise their children whilst using digital technology. 77.14% of those surveyed felt that they were more than 90% responsible for providing proper supervision. 94% of all parents believed that the technology industry should educate parents regarding the safe use of digital technology by young children. Only 47% of parents from all age groups believe that the technology industry is education the public, 4.5% are not sure and 2% disagrees.

5.5.5 Sub-Question 5:

What impact does parent's ages make on their children's use of digital technology?

Both Formby (2014) and Mardsden's (2013) research, suggests that younger parents do not let their children use technology more than older parents. My research showed that parents from all age groups place limitations on their children's use of digital technology, the younger the child the more restricted. The research also showed that parents from all age groups allowed their children to use digital technology for the following reasons: reading

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stories, watching stories, singing songs, playing games, playing educational games, painting and drawing. Parents from all age groups felt that the technology industry should educate the public regarding young children's use of digital technology. It is clear that the age of parents does not really have an impact on young children's use of digital technology.

5.5.6 MAIN RESEARCH QUESTION:

How do parents' experience the use of digital technology by their young children at home?

The research findings showed that most parents agree that today's digital technology can help their children with educational development. It is important to note that parents do realize that the misuse of these digital technologies can be harmful to their young children. Parents also indicated that they believe that their child would be disadvantaged if he/she is not allowed to use digital devices. The majority of parents limited their children's use of digital technology. Regardless of the age group of the parents, it was clear that the younger the children, the less time was allowed on a digital device. All the parents surveyed indicated that their children between the ages of 0 and 1 year were not allowed to use digital technology for longer than 15 minutes daily. The majority of parents also felt that children should only start using digital technology at the age of 2 years. The majority of parents felt that the technology industry should educate the public on how to use digital devices safely for young children. Children mostly used digital technology to watch programmes and play educational games.

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5.6 EMERGENT THEORETICAL FRAMEWORK

5.6.1 RELATIONSHIP BETWEEN THE THEORETICAL FRAMEWORK AND THE DATA

The study was based on the 'Social Construction of Childhood' theory in conjunction with the concept of Prolepsis. Two discourses were evident from the research concerning parental perspectives regarding young children and the use of digital technology. Some researchers consider technology to be beneficial for young children as seen in the literature review, while other researchers remain cautious due to the potential negative impact. These discourses are also evident in the results of the online survey. Some parents felt that children younger than 8 years should not use technology at all, whilst other parents felt that their children would fall behind their peers if they were not allowed to use technology at all. The study also found that parents who struggle with technology often projects this experience onto their children, by not allowing or restricting their children's use of digital technology, this correlates with the concept of prolepsis.

5.7 FINDINGS AND RECOMMENDATIONS

The aim of this research study was to focus on parents' experiences of young children's use of technology and how they can support, manage and control the use of technological devices within their homes. The results of this study is significant since it reveals that South African parents do let their children use digital technology form a very young age. The study also reveals how parents feel regarding their young children and the use of digital technology. The results, and the recommendations made in terms of these results, are discussed below:

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5.7.1 Finding 1: The age at which children start using digital technology

Parents often allow their children to use digital technology from a very young age. Some parents indicated that they even allow their children younger than 6 months to use digital technology for things such as singing songs, reading and listening to stories and playing educational games. The majority of parents believed that the appropriate age for a child to use digital technology is only after 2 years. This correlates with other research studies done, as explained in the literature review.

Recommendation:

Parents must ensure that the technology used is not harmful for their child. Parents with children younger than 2 years should co-use technology with their child. Parents should always supervise their children whilst using technology, and technology should not be used as a babysitter but rather as an opportunity for learning.

5.7.2 Finding 2: Time limits whilst using digital technology

Even though parents allow their children to use digital technology from a young age, most do set time limits. The younger the child, the less time is allowed on a digital device, for example 76.16% of children under the age of 2 spend less than 15 minutes per day on a digital device, whereas 32.95% of children between the ages of 3 and 5 years spend less than 15 minutes on a digital device and 27.90% of 6-8-year-olds spend less than 15 minutes on a digital device. Even though some researchers suggest that children younger than 2 should not use digital technologies at all (American Academy of Pediatrics, 2001; Australian Department of Health, 2014; Linn *et al*., 2012) only 46.80% of the parents indicated that their children under the age of 2 years did not use digital technology at all.

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Recommendation:

Parents should limit the amount of time their children spend using digital technology, especially when they can use digital technology on their own. It is my recommendation that children between the ages of 5 and 8 years should not exceed 1 hour daily on a digital device. Children between the ages of 2 and 5 should spend a maximum of 30 minutes and children between the ages of 0 and 2 should spend no more than 15 minutes per day using a digital device.

5.7.3 Finding 3: The need for more guidance regarding young children and the use of technology

It is clear from the research done that parents feel they are not getting adequate information or guidance from the technology industry on how digital technology or applications can be safely used by young children. Parents also feel that the technology industry should take far more responsibility for educating the public on the safe use of digital technologies by young children.

Recommendation:

When a new digital application is developed for young children it should be issued with guidelines that advise on the safe use of the application. I also recommend that parents should be made aware of the recommended time limits that apply in accordance with children's ages.

5.7.4 Finding 4: Parents perceptions regarding young children's use of digital technology and the developmental impact thereof

The majority of parents believe that digital technology can have a positive developmental impact on their child in areas such as language, mathematics, problem

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solving and fine motor skills. 35.71% of parents felt that digital technology cannot be beneficial for young children, with 20.71% believing that it is actually harmful for their child's social development.

Recommendation:

Parents should research an application before they allow their child to use it. Often you can find online ratings of an application and I recommend that parents read the ratings and the description of the application before they download it to make sure that the application is appropriate as well as educational.

5.7.5 Finding 5: The positive and negative impact that digital technology has on young children

It is clear that digital technology can have both a positive and negative impact on a young child. When digital technology is used too extensively it may lead to problems such as childhood obesity, sleep disturbance, learning problems, attention problems, social problems, aggression and addiction (Linn *et al*., 2012; Christakis *et al*., 2006; Bravo *et all*., 2016). When technology is used appropriately though, it can have a positive impact in areas such as social development, cognitive development, emotional development, creativity, problem solving and school readiness (Zevenbergen, 2007; Kalas, 2013; Wood *et all*., 2016; Fleer, 2014; Nicolopoulou, 2010). Most parents felt that digital technology is more likely to be beneficial than harmful for their young children. The majority also agreed that it would have a negative impact on their young children if they are not allowed to use digital technology at all.

Recommendation:

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Parents should accept that technology can be both positive and negative for their young children and that their involvement and facilitation (or lack thereof) might well determine whether it has a beneficial or detrimental effect on their child/children. Parents should not allow their children to use digital technology excessively; they should rather put time limits on their children's use of digital technology. I recommend that parents allow their children to use digital technology as barring them from using technology could result in them lagging behind their peers when they start school.

5.7.6 Finding 6: The role parents play whilst their children use digital technology.

The majority of parents felt that it was their responsibility to supervise their young children while they use digital technology, as misuse of digital technology can have a negative impact on their child/children's development.

Recommendation:

Parents should always supervise their children's use of digital technology, no matter the age of the child, to prevent things such as misunderstanding of concepts, addictive behaviour or the accessing of inappropriate content.

5.7.7 Finding 7: How parents should use technology at home with their young children

It is clear from the research that parents should be actively involved while their young children use digital technology, not only for better developmental outcomes but for the safety of the child. Parents should also monitor their children's use of digital technology for example how long they use a device and what type of content the child has access to. Parents should use scaffolding to best facilitate the use of mobile devices (Yelland & Masters, 2007; Wood *et al*., 2016).

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Recommendation:

Parents of all ages should be encouraged and educated on how to let their children use digital technology safely. Parents should not let their own experiences – including possible frustrations and negative experiences from the past – stand in the way of great new opportunities for learning, both for their children and themselves. Parents should make sure that applications that claim to be educational are indeed educational by doing the appropriate research.

5.8 FURTHER SUGGESTED RESEARCH

Research on young children and the use of digital technology is still sparse and patchy, therefore further research should be done concerning this topic. Technology changes at a very rapid pace and research should try and keep up. The following are suggestions for further research studies:

5.8.1 Suggestion 1

An in-depth study on the positive and negative impact that digital technology can have on young children and the use of digital technology, especially children between the ages of 0 and 8 years.

5.8.2 Suggestion 2

A study regarding the age at which children can start to use digital technology safely.

5.8.3 Suggestion 3

A study on parental perceptions regarding digital technology and the use thereof by their young children, especially in more rural areas.

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5.8.4 Suggestion 4

A study on the level of mediation that parents give their children whilst using digital technology.

5.9 CONCLUSION

With digital technology changing as rapidly as it currently is, more young children have access to digital devices and are allowed to use these devices from a very young age. Thus technology is playing an increasing role in young children's lives. This study demonstrated that parents tend to let their children use digital technology from as early as 6 months, but the majority agreed that children should only start using technology at the age of 2 years. Parents can be seen as the gatekeepers of their children's use of digital technology and it is evident that when parents themselves feel frustrated whilst using digital technology, they are more inclined to limit their children's use of digital technology. To help determine how South African parents experience young children's use of digital technology for learning at home, the emphasis of this study was placed on the possible advantages and disadvantages that technology can have on young children; how and for what purpose children make use of digital technology; the role parents play when their children use digital technology; as well as the impact that digital technology can have on young children's development. Despite their concerns, the majority of parents felt that their children would be disadvantaged if they were not allowed to use digital technology at all.

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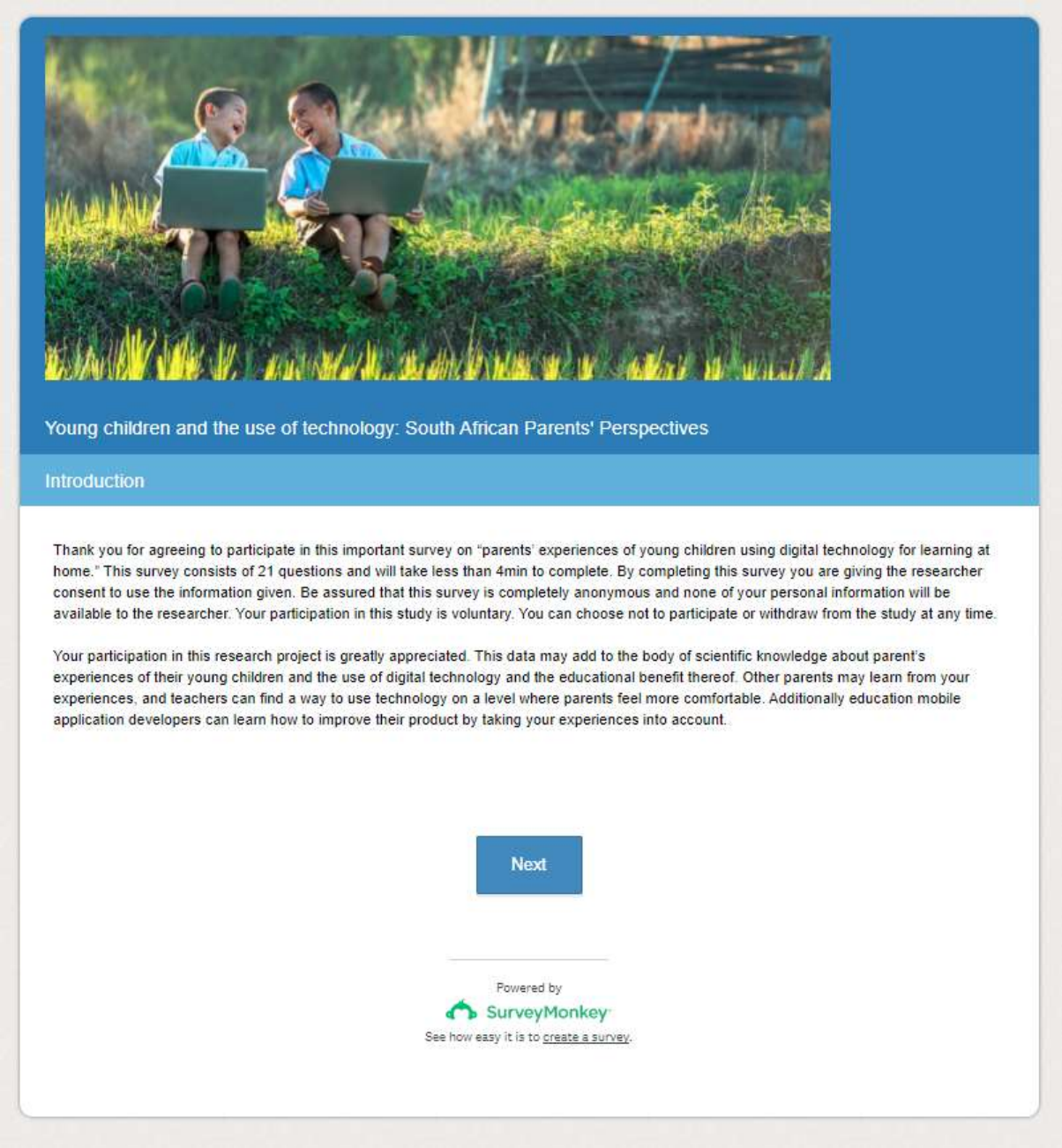
ADDENDUM

7.1 ONLINE SURVEY



Background details

1. What is your nationality?

2. How old are you drop down

3. Please indicate your child's/children's age and gender

	Male	Female
0-6 months old	☐	☐
6 months - 1 year old	☐	☐
2 year old	☐	☐
3 year old	☐	☐
4 year old	☐	☐
5 year old	☐	☐
6 year old	☐	☐
7 year old	☐	☐
8 year old	☐	☐
Older than 9	☐	☐

If you have twins or triplets, please indicate in the comment box below.

4. How frequently do you use digital technology for reasons other than phone calls or email?

Please choose one of the following

Never	Very seldom	Monthly	weekly	Daily
○	○	○	○	○

5. On a scale of 1 to 10 how often do you get frustrated whilst using digital technology?

Please choose one of the following

	Not at all 1	Somewhat 2	Moderately 3	A lot 4	Extremely 5
How often do you get frustrated whilst using digital technology?	○	○	○	○	○

Prev Next

Young children and the use of technology

6. Which of the following technologies does your child(ren) younger than 8 years of age use at home?

Please choose one or more of the following:

- [ ] Tablet device or e-Reader with Internet access
- [ ] Video game console
- [ ] Smartphone
- [ ] Laptop computer
- [ ] Desktop computer
- [ ] Handheld gaming device
- [ ] Tablet device or e-Reader without Internet access
- [ ] Cell phone (not a smartphone)
- [ ] None of these
- [ ] N/A All my children are older than 8

7. How much time does your child, younger than 8 years of age spend on digital devices, such as smartphones, computer, tablets etc. daily?

Please choose one of the following:

	Less than 15 min	15-30 min	30 min - 1 hour	1 hour -2 hours	2 -3 hours	more than 3 hours
My child spends ____ daily on digital technologies	○	○	○	○	○	○

If you have more than one child whose time spent on digital devices differs significantly, please indicate below.

8. Please indicate what your child(ren) use digital technologies for.

Please choose one or more of the following:

- [ ] Reading stories
- [ ] watching stories
- [ ] singing songs
- [ ] playing games
- [ ] playing educational games
- [ ] Painting
- [ ] Drawing
- [ ] My child does not use technology

Other (please specify)

9. Do you set limits on your child's'/children's use of digital technology eg. watching or playing time?

Please choose one of the following:

- ◯ Yes
- ◯ No

10. To what extent do you believe it is your responsibility to supervise your child(ren) whilst using digital technologies?

Please choose one of the following

Not at all	Less than 10%,	10-30%	30-50%	50-70%	70-90%	More than 90%
◯	◯	◯	◯	◯	◯	◯

11. Which statement do you agree with more?

Please choose one of the following:

- ◯ Today's technology can help young children (0-8) with educational development
- ◯ Today's technology can harm young children's (0-8) educational development
- ◯ Not sure

12. Please choose an age to complete the following sentence:
Children should first be allowed to use digital technology at the age of .....?

[▲▼]

Read each of the following statements below and choose the most appropriate to you.

13. Misuse of today's technology can be harmful to young children's development.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
◯	◯	◯	◯	◯

14. Appropriate use of today's technology can enhance my child's development.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
◯	◯	◯	◯	◯

15. Technology will enhance my child's/children's speech and language skills.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

16. Because of technology, I have fewer conversations with my child(ren) than I would like.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

17. My child(ren) would be disadvantaged if he or she is not allowed to partake in any activities involving technological devices.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

18. The technology industry should help educate the public about using technology safely.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

19. The technology industry is doing what it should to help educate the public about using technology safely.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

20. It is hard to stay current with news about how misuse of technology may impact my child's/children's development.

Please choose one of the following

Strongly agree	Agree	Not sure	Disagree	Strongly disagree
○	○	○	○	○

21. How beneficial do you think digital technology can be in the following developmental areas?

	A lot	Somewhat	Not sure	Not a lot	Not at all	Harmful
Social development	○	○	○	○	○	○
Language development	○	○	○	○	○	○
Mathematics	○	○	○	○	○	○
Problem solving	○	○	○	○	○	○
Fine motor skills	○	○	○	○	○	○

Prev Done

Young children and the use of technology: Parents' Perspectives

Thank you for completing my survey! The results will be published on the Facebook page "Young children and the use of technology".

Done

7.2 LANGUAGE EDITOR CERTIFICATE

DECLARATION OF REVIEW & EDITING

This is to certify that I, the undersigned, performed a language edit on the document:

PARENT EXPERIENCES OF CHILDREN USING DIGITAL TECHNOLOGY FOR LEARNING AT HOME

by

Andrea van Jaarsveld

Disclaimer

The text was reviewed and edited with 'change tracking'. As such, the document I submit is fully editable, and the author is entitled to accept, reject, or modify my changes and suggestions. The final version of the document, submitted for assessment or publication by the author, may differ from that suggested by me.

Anton Ferreira
12 October 2017

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