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Masters of Arts Degree in Research Psychology

**Parents' perceptions of the use of technology in South
African primary schools**



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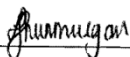
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Abstract

Despite 20 years of democracy, education in South Africa is still plagued by the inequalities carried over from apartheid. Concerns on issues of standardisation in education, which are linked to socio-economic status, make it increasingly difficult to determine what skills learners are leaving the schooling system with (Blignaut, 2009; Du Plessis & Webb, 2012; Lumadi, 2011; Maiyo, 2015; Watts, 2001). There is a need to bridge the gap that currently exists within education, and one way in which this is thought possible, is through the integration of technology in the classroom (Department of Education, 2004). In 2015 the Smart Schools Project was put in place to promote the implementation of technology in South African schools. One of the aims of this project is to standardise education through redressing the inequalities within the country. This study aimed to investigate the perceptions of parents, with regards to the introduction of technology within primary school classrooms in South Africa. In order to achieve the main aim of this study, perceptions of parents were explored from parents whose children were in private and government-funded schools. This study used a combination of two models in order to understand how parents' usage and acceptance of technology could possibly influence their children's interaction with technology. This study found that how parents come to use and accept technology is not influenced by socio-economic status. Further, it was noted that acceptance and usage impacted how they viewed technology being introduced in the classroom.

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Parents' perceptions of the use of technology in South African primary schools

Chapter 1: Introduction

1.1. Introduction

Despite 20 years of democracy, education in South Africa is still negatively impacted by the inequalities carried over from apartheid. Concerns on issues of standardisation in education, which are linked to socio-economic status, make it increasingly difficult to determine what skills learners are leaving the schooling system with (Blignaut, 2009; Du Plessis & Webb, 2012; Lumadi, 2011; Maiyo, 2015; Watts, 2001). There is a need to bridge the gap that currently exists within education, and one way in which this is thought possible, is through the introduction of technology in the classroom (Department of Education, 2004). This technology integration has led to many debates, and at the root of these debates are the stakeholders' perceptions and attitudes towards technology. However, there appears to be a lack of published research on the attitudes and perceptions of parents towards technology, especially within the South African context. This is therefore seen as an important aspect that should be addressed and studied, and this should be studied in relation to how parents feel about this integration, especially given the prominent influence they can exert over the manner in which their children engage with technology.

1.2. Rationale

Due to the lack of equality and standardisation in education within South Africa, there is a need to study technology in education, as a child's education can have lifelong consequences (De Beer, 2007; The World Bank, 2014). Here; technology is seen as a means of standardisation. Standardised or equalised education in this research study referred to equality, with regards to the distributed resources that are available, the learning conditions that children are subjected to, the skills being taught and thus the opportunities being afforded to children due to these skills (Hirst & White, 1998). This is important to understand as a concept since it is noted that the type of education one has, determines the futures of children as economical contributors

(International Labour Conference & Internationales Arbeitsamt, 2002; Nkabinde, 1997). Standardised education here means to provide an equal ground and equal opportunities for all.

Outside of South Africa, lower socio-economic status schools are known to be associated with a lower quality of education (Adebakin, Lawal, & Olaniran, 2011; Maiyo, 2015; Song, 2012; Zhang, Li, & Xue, 2015). Standardising education here seems to be of the highest regard, since it dictates the futures of children to play an active role in the workplace and society. Children should be equipped with the right tools and skills in order to do so meaningfully and effectively. The lack of standardisation seen in education today is of concern, since higher socio-economic status schools offer more opportunities for skill development and skill attainment than that of lower socio-economic status schools (The Conversation, 2015). This could have unjust and uneven consequences when those who are not equipped with essential skills enter the economy. Therefore, there is a division in the sets of skills children are leaving the schooling system with, since government and private school types offer different skill building opportunities.

Since technology integration in education is being seen as a means in which this standardisation can occur, it is important to understand the value of this integration, as well as the perceptions surrounding it. If one can understand the perceptions around this move, then one may have a better understanding of the potential impact it may have, as it is known that performance of a task is affected by the attitudes towards it (Awang et al., 2013). Since it is noted that parents play a pivotal role in the education of their children, parents' perceptions will affect how the child views technology, which may influence their child's technological capabilities (Gauteng Department of Education, 2010). Through this, it is important to understand what parents think about technology in classrooms to understand the impact they can have on their children's interaction of technology. This is further supported through the fact that when parents and children interact through technological means for learning purposes, there is a positive impact on the learning process (Correa, 2014). Here, we can see the importance of the positive learning relationship for children, through their parents, and the importance of studying the perceptions of parents to make this as effective as possible.

Students', teachers' and principals' attitudes and perceptions of technology in schools have already been studied worldwide (Bovée, Voogt, & Meelissen, 2007; Hamzah, Embi, & Ismail, 2010). However, within South Africa there does not appear to be published research exploring and investigating parents' perceptions regarding the integration of technology in this country, and more specifically in its classrooms. Through the proposed study, a research gap of parents' perceptions on new innovations within education will be investigated, in order to give parents a voice. It can shed light on technology and education from an important perspective within South Africa.

In the recent endeavour of introducing technology in some high schools for students to use, the broader aim is to start this introduction within the final year of primary school (Falanga, 2015; Sapa, 2015). Since this introduction will start earlier, parents may have different views on how comfortable they are with technology exposure to their children on a day to day basis, especially if they themselves are not comfortable with technology use. Further, due to the prolonged exposure children will have with technology (Grade7- Grade 12), the need to understand parents' perceptions is of more importance, since children and parents need to be comfortable with technology, in order to profit from e-learning's benefits (Humble-Thaden, 2011). Therefore, this research is vital in uncovering if there is a need for technology education for parents, such that they become more comfortable with technology.

It is felt that the South African Department of Basic Education has a pivotal role to play in changing the education system through the implementation of technology in classrooms; however, it is important to uncover and address the views of parents that may affect this implementation. This research may aid in this endeavour and may promote more standardised education through policy change. This has this potential as there is a need to understand how all stakeholders play a role in the lives of children, especially parents, whose concerns should be heard and addressed accordingly within the Department of Basic Education.

Naledi Pandor, former Minister of Education, has stated that the government has addressed educational needs before, ensuring that it is free of the stigma of the past (Pandor, 2001). It is further stated in the Children's Act 38 of 2005 (The Department

of Justice, 2005), that the state has the obligation to ensure that schools address students' needs, which includes the need to develop skills and aid growth, and it is reiterated in other state documents (Department of Education, 2004). If this is the case, then the government does have the right and responsibility to step in again, to ensure the wellbeing of the children of the country and redress any inequalities that may be present. This will ensure that interventions can be successful in standardising education. Following this, students can be equipped with the same skills, and this may lead to a better educated society, while eradicating the effects of the past.

1.3. Aims

This study aimed to investigate the perceptions of parents, with regards to the introduction of technology within primary school classrooms in South Africa. In order to achieve the main aim of this study, perceptions of parents were explored from parents whose children were in private and government-funded schools. From this, socio-economic status could be inferred, since there was a vast difference in pricing of private and public schools; however socio-economic status was also tested against different factors. It must be noted that the aim of this research was not to validate this combined TRA and TAM model in the South African context, but rather to use this as a framework in order to understand how parents' attitudes affected their children's use of technology in the classroom.

1.4. Research Questions / Hypotheses

The primary research question that was investigated in this study was:

- What are the perceptions of parents regarding the integration of technology in primary school classrooms in South Africa?

In order to explore the above research question in more depth, the following additional questions were asked:

- Is there a statistically significant relationship between socio-economic status and the perceived usefulness of technology?

- Is there a statistically significant relationship between socio-economic status and parents' acceptance of the integration of technology in the primary school classroom?
- Do parents, whose children attend private schools, differ in their perceptions, when compared to parents whose children attend public schools?

1.5. Concept Clarification

There are two concepts that are intrinsically important for this research, which are parents and technology which will be elaborated upon. Parents are the main focus within this research, and it is important to define how parents are described in policy documents, such that there is an indication of who can and cannot be addressed in this research.

According to the South African Schools Act, No 84 of 1996 (Department of Education, 1996), parents are defined as being “ a) the biological or adoptive parent or legal guardian of a learner; b) the person legally entitled to custody of a learner and c) the person who undertakes to fulfil the obligations of a person referred to in paragraphs a) and b) towards the learner’s education at school” (p. 5). With this in mind, parents are those who are responsible for their children, and they play an important role in their children’s lives.

Although there are many conceptualisations of technology, within this research, technology devices are referred to as any electronic devices. These include Information Communication Technology (ICT) devices that can be used within the educational sphere to promote e-learning in the classroom (Department of Education, 2004). These can include iPads, tablets, electronic white boards, projectors, computers, and videos to simulate e-learning. This research takes into account these definitions and examples of technology when technology is being referred to. It is important to note that this research takes into consideration that technology has not been completely absent from education in South Africa, but recognises that it is becoming more and more emphasised and integrated within the system in recent years. The emphasis on technology in education is not only being

driven by the integration of technology by teachers, but of learners too, with the influence of their parents.

1.6. Chapter Overview

This chapter has presented some difficulties experienced within the current South African education sphere and the efforts that have been made to reduce the current inequality in education. It has also presented the importance of understanding how parents may be influential in the educational context. The following chapters will outline the literature, the methodology, results and discussion of this research, in an attempt to understand parents' perceptions in their children's use of technology.

Chapter 2: Literature Review

2.1. Introduction

Although apartheid discriminated through race; today there is a discrimination based on socio-economic status, which continues to affect every aspect of the South African society; especially education (Taylor & Yu, 2009). This has led to problems within the educational sphere, and has had implications for the different standards of education present today. This chapter will examine the relevant literature on education in South Africa, the importance of technology and technology integration in South African classrooms and parents' perceptions of this. This will be done through a closer examination of the way forward for South African schools, especially within the context of e-learning, and the continued integration of technology accompanied by the acceptance and usage of technology.

2.2. Education in South Africa

2.2.1. Legacy of Apartheid. Before apartheid had occurred, colonialism had been prejudice toward African individuals, and the missionaries had come in the country to enforce their structures and ideals (Mnguni, 1998). Apartheid thereafter, was one of the most momentous events in South African history, spread out to many different sectors of society including education. During this era, education was the "instrument of oppression" that was used by the government (Mnguni, 1998, p. 143). The purpose of this was to maintain order based on racism, inequality, inferiority and difference (Kallaway, 2002; Mnguni, 1998; Nkabinde, 1997). These values based on difference were built on the premise of racism, and was the foundation for apartheid. This era was one of the roots that ensured that education in South Africa was not of one standard, but different standards based on your race group. This meant that white education was the most superior form.

In order to maintain control over the regime, Bantu education was put into place by the government, followed by separate education for Indians, coloureds and whites (Kallaway, 2002; Nkabinde, 1997). These separate educational acts and policies, ensured that people of colour were seen as inferior to their white counterparts. Within Bantu education, this meant that people of colour were taught skills that they needed, in order to be labourers (Mathieson, 2001; Nkabinde, 1997). People of

colour were not given the opportunity to excel and become professionals due to this education, which ultimately has resulted in a large portion of black South Africans to remain within a lower social class due to their lower incomes (Mathieson, 2001). The educational system during apartheid not only discriminated based on race, it went above and beyond that, and kept perpetuating inequality and difference (de Villiers & Ntshoe, 2014; Kallaway, 2002). This education trained black South Africans to become labourers, keeping them at a lower status and keeping them in poverty. This regime was one that was based on segregation through race, and excluded those of colour for the opportunities based on the colour of their skin.

It was noted that the white education system during the era, in quality, was “approximately eight times better than that offered to Africans” (Mnguni, 1998, p. 145). With this in mind, this means that black South Africans had eight times less opportunities, and eight times less resources available to them, than their white counterparts. This speaks to the lack of standardisation in education that was reproduced and upheld during that era, and has continued today. The lack of standardisation present today may not be due to race, but it is due to the lack of socio-economic wealth, which was due to the segregation and non-uniform education offered. This lack of wealth is perpetuated within schools today, and can be seen through the resources available, the quality of education today and the opportunities provided due to the skills learnt.

2.2.2. ‘Born Free’ Education. Education today has been tainted by the effects of apartheid. Apartheid is seen to have reinforced poverty, depriving those of the opportunity of an education that allows them to be more than just labourers (Kane-Berman, 2015). In turn, the culture of poverty that they maintain today, is due to their lack of standardised education, and has enabled their children to possibly have the same fate. Those born during the post-apartheid era, were named the ‘born-frees’, and this is due to the fact that they were not directly affected by apartheid (Kane-Berman, 2015). The ‘Born-free’ generation however, remains indirectly affected by the inequalities of apartheid.

The schooling system that is within the country has seen that the majority of schools are irrelevant, unstandardized and of poor quality (Kane-Berman, 2015; The

Conversation, 2015). Although this is not explicitly advertised, this remains a problem within the country. It means that children are not receiving the same quality of education, and by default, the same skills. This is problematic since the government had intended for schools to be supportive of children's' rights to growth and development, especially within the education system (Department of Education, 2004; The Department of Justice, 2005). This then violates children's' basic rights within the country, as the development and growth of children is not being actively supported within the schooling system, as it should be (The Department of Justice, 2005). If a child's wellbeing is of most importance and concern, then all children's education should ensure that they develop to their fullest potential, and that they excel. This lack of standardisation in education not only allows for certain children to be discriminated upon, due to the schools they attend and the quality of education that follows, but it also discriminates in the resources available to certain schools.

Through being stuck in this cycle of poverty, children are not learning the same skills as those who are in better resourced schools (The Conversation, 2015). Instead of actively implementing the same quality of education across the board, today's educational system limits children with the types of opportunities afforded to them, dependent on the types of school they can afford to attend. Different types of schools in South Africa have different payment plans, different resources, different funding, and thus there is no standardised education system (Ahmed & Sayed, 2009; Sayed & Motala, 2012; van der Berg, 2001). This has resulted in the unequal resources available to students which include libraries, laboratories, books, computers, and interactive white boards to name a few, which continues to widen the gap between the qualities of education available. Those who do not have access to the resources above, will not receive the same level of education, since, some will have the opportunity to engage better with content and resources, while others will not.

Despite the continuous efforts to combat the effects of apartheid, a large degree of inequality remains within South African schools today. This is often due to a lack of appropriate resources which has led to a lack of standardisation in education (Du Plessis & Webb, 2012; Mathieson, 2001; Sayed & Motala, 2012; Statistics South Africa, 2015; Van der Merwe, 2011). This standardisation refers to the resources available to the school, the teachers and the quality of teachers, along with the

opportunities offered which is based on the education that children receive. Children who have the opportunity to engage with more resources, other than just instruction, may learn better than those who merely have to read about it (Lapp, Flood, & Farnan, 2005).

A study conducted in the Limpopo province, highlighted this discrepancy and lack of resources, with one participant noting that, “You cannot compare our achievements with those of the white schools. We have no research facilities, not enough classes ... no laboratories” (Van der Merwe, 2011, p. 116). Although there is a distinction between white and black schools here, this could reflect socio-economic status due to apartheid’s legacy. This may further reflect the difference in government against private schools, or alternatively better resourced government schools and poorly resourced government schools (The Conversation, 2015). This is further supported through the evaluation of post-apartheid transitions in education, whereby it is indicated that, more privileged communities receive more resources within those schools (Van der Berg, 2001). Thus, there are clear inequalities being reflected, and since there is no standardised supply of resources, there will automatically be a lack of standardisation within schools, which affects the skills students learn.

2.2.3. Resources, skills and poverty. In other parts of the world, the gap within education lies with the types and quality of education based in rural areas, while in South Africa this gap not only incorporates this, but it is also linked to a lack of standardised necessary resources. A lack of resources has implications of the limited skills that will be taught within schools. Accompanied by this, it is stated that the decreased number in “skill and ability in the population” has implications for other problems within a country (Heckman, 2006, p. 1901). These low levels of skill that is referred to, is directly attributable to the education system within a country, and this is especially true of South Africa today. Therefore, this means that under-resourced schools are putting children at a disadvantage, since they are being limited to the skills they can be taught. This further means that the lack of skills will perpetuate a vicious circle, which encompasses problems both socially and economically, and does not only affect the child, but will affect the country at large (Heckman, 2006; Taylor & Yu, 2009; Van der Merwe, 2011). Through all of the above, there is a need

for some sort of intervention at an educational level, so that the country can strive towards a better future.

According to the General Household Survey conducted in 2014, there were 13 883 000 children registered in school, and an estimated 2 342 000 who were furthering their studies beyond school (Statistics South Africa, 2015, p. 92). This indicates that only a fraction of people who finish school end up furthering their studies, and gaining higher levels skills and abilities (Kane-Berman, 2015). Of the approximately fourteen million students in schools, it is reported that six percent of those students attend private schools (Statistics South Africa, 2015, p. 18). With this in mind, the increased number of children within the government schooling system, and the large proportion of children who do not end up furthering their studies, calls for standardised schooling that provides children with the same skills and opportunity. If this does not occur, then this becomes a new form of segregation based on socio-economic status and schools. With ninety-four percent of learners in schools depending on government funding for education, added with the resources needed, this is a huge obligation and burden for the state (Kane-Berman, 2015; Murtin, 2013). With this increased state dependence, knock-on-effects for the quality of education available is seen. These concerns of standardisation within education are confirmed through the larger proportion of children being dependent on the state for education. Added to this, there is little to show for the quality of this education since grade 12 pass rates continue to decline (Quintal, 2016).

It is noted that, disadvantaged backgrounds (lower socio-economic status backgrounds), negatively affects academic performance (Howie, Scherman, & Venter, 2008; Kane-Berman, 2015). This is due to various factors, which encompasses a lower access to resources, flexibility of teaching mediums and the quality of teachers available (Howie et al., 2008; Machet, 2002). These factors were noted to be related to socio-economic status, which indicates that not only does socio-economic status limit the opportunities students will have outside of school, but within school as well. Students have limited access to the resources available to them at school, which becomes even more scarce within their homes (Cooper & Crosnoe, 2007; Howie et al., 2008; Machet, 2002). This trend of the lack of

resources and skills, due to poverty and lower wealth, replicates the system of inequality experiences in the post-apartheid South Africa.

It has been stated that the educational system within South Africa needs to be changed and revived, in order to avoid crippling the country (Heckman, 2006; Letseka, 2014). As per 2011, the GINI co-efficient has shown large inequality in South Africa, even after seventeen years had passed since the first democratic elections (World Bank, 2011). This indicates that there are a large number of inequalities in the country, which reflects that there is more to be done to bridge the gap between rich and poor, and therefore the gap between the poorly educated and the well-educated.

2.3. Socio-Economic Status (SES)

Socio-economic status (SES) has an impact on every individual's life and plays a significant role in education. It has been noted that "economic inequalities are equally reflected in education" (Wangenge-Ouma, 2012, p. 839). A similar finding was noticed in China, whereby lower socio-economic status areas were given less subsidies, which as a result led to less resources for education (Song, 2012). This indicates that SES is influential, and is seen in the quality of life children will one day have, because of how they have been educated, their resources and by extension the opportunities afforded to them. Thus, if low SES is observed, there appears to be a link to lower rankings of education, which therefore translates into less technology and technological skills, and therefore fewer opportunities. This chain reaction is supported by research, showing that SES is a large contributor to education in South Africa, and thus the performance on educational tasks (Taylor & Yu, 2009).

It has been found in a study measuring academic performance of South African children, when compared internationally, that generally South African children perform worse, which indicates that there is something vital lacking within the educational system (Taylor & Yu, 2009). Within the test used to measure this, SES was considered. Along with some aspects that constituted low SES within South Africa, items such as: not having "computers" and not having their "own cellular phone" were asked (Taylor & Yu, 2009, p.69-70). This indicates that, these are some aspects which are considered to be reflective of SES, and is reflective of the access

one is believed to require as a basic necessity. This lack of access could deprive students of skills and abilities that they need to measure up to students internationally. Parents' socio-economic status is important to understand in this context since parents' SES is the determinant of the opportunities, to a large extent, that children will have through the schools they attend.

Although SES is a bigger issue than that which lies with parents alone, the outcome of parents' SES is instrumental. Parents' SES is determined by the jobs parents have and their income associated with this, as well as their educational levels (Riegelman, Riegelman, & Kirkwood, 2014). Through this, it is not difficult to see that SES is a huge factor in the quality of life that parents and children will come to experience. Lower SES is less likely able to afford expensive technology, be trained on it and use it in their workplace, as well as be able to afford to have a better quality of education for their children through private schools or live in better areas with good government schools. Being discriminated upon based on SES affects education and jobs.

It is mentioned that because performance of educational tasks are affected by SES, it is important to examine the effect of school and home SES, as they both impact the way a student performs (Taylor & Yu, 2009). It has been recommended that one way in which to reduce inequalities is to promote the acquisition of high level skills, and to continue "investing in disadvantaged young children" (Heckman, 2006, p. 1902). There have been numerous attempts previously, that have tried to bridge the gap of inequality, through "no-fee schools policy" which has helped to some degree (Sayed & Motala, 2012, p. 673). It is noted in the White Paper on e-education (Department of Education, 2004), that attention to the introduction to Information Communications Technology (ICT) can redress and overcome obstacles that may be presented by SES. Through this, SES is an important enough hurdle that is recognised by the government in which they are actively trying to rectify. Therefore, SES should be important in this research to uncover since this is the important issue that is being raised and one of the reasons that technology is being introduced and integrated more and more in recent times.

By redressing inequalities, we not only ensure a better future for all, but we ensure a better future for the country as well (Heckman, 2006). This therefore gives some hope to educational realms within the country, as technological integration may be what is needed for students to perform better, despite their SES. Since SES is a contributing factor to children's academic performance, which is evaluated based on their parents' SES, it is important to understand what technology is and how technology can be integrated. This is a means of standardising education across socio-economic groups, by ensuring that every learner leaves school with the same skills and has equal opportunity.

2.4. Technology

Technology is becoming increasingly important, and is recognised by many, to impact various aspects of society and improve them; education included (Department of Education, 2004). Definitions of technology include electronic devices, devices that make life more convenient, efficient and sometimes has the ability to help people communicate through ICT (Department of Education, 2004; Harrington, 2011; Manning & Johnson, 2011). Since technology is recognized to be electronic devices, this includes iPads, computers, tablets, interactive white boards, laptops, smartphones and so forth. These technologies are associated with convenience and increased communication, which can be helpful in our day-to-day lives (Woodford, 2006). This research uses this conceptualisation of technology as electronic devices that are designed to improve communication and efficiency.

Although technology is becoming more and more prevalent in today's world, technology still remains an expense that some people may not always be able to afford. Although technology today is becoming more and more affordable, with the varying levels of socio-economic status evident in South Africa, a large amount of unemployed people and many people dependent on grants, are not able to invest in these technological devices ("Metropolitan Municipality | Statistics South Africa," 2011). Gaining access to many people here becomes an issue while this is accompanied by the limited amount of training that will be available from a day to day perspective, which has the potential to impact negatively, on how lower income parents perceive technology. Where technology is introduced and used in

companies, these parents may have more access and training available to technology which may have a positive outcome on how these parents come to use technology.

Technology is important, and some may not be afforded access to its benefits, or the training of these skills that other schools benefit from, through the implementation of technology. As a result, these technological educational opportunities available to some continue to discriminate against poor students, which in turn hinder their opportunity, accessibility and ultimately their future prospects. Thus, it is seen by the Department of Education (2004), that introducing technology in all schools is a way to standardise the skills learnt and are making it a priority to introduce the same opportunities to government-funded schools. This will not just level out the playing field across students, but will produce a greater number of people with skills within the country. It has been noted that South Africa has not been separated from the globalising world, and because it is a part of it, it has to become more technologically advanced and able to use technology effectively (De Beer, 2007). Thus, the use of technology is seen as a way to standardise education, a means for learners to grow their knowledge base and a means through which they connect with others on a different platform both locally and internationally.

2.5. Technology in Education

Technology in education is defined as, the “developing of computer literacy and skills”, “the ability to create knowledge and new information” through the use of technology, and the ability to “function in a knowledge society by using appropriate technology” (Department of Education, 2004, p. 14). Through this, it can be seen that there are benefits in acquiring technological skills, such that one is able to function within our society at large, which is increasingly becoming more and more technological. This also implies that these skills should not just be for the privileged few, but it should rather be available to everyone, as it is becoming a need. It has been emphasised that education that does not incorporate technology within it, prevents growth within the country, and limits its access to becoming a part of the “global economy” (Goldin & Katz, 2008). With this in mind, should our intention be for

the country to be a part of global economy, and be able to engage globally, children need to be taught at a national level, how to use technology effectively.

When technology and education are combined, there is a greater impact on how children can learn, how they can interact with information, and be more prepared for the workplace (Blignaut, 2009; Department of Education, 2004; Goldin & Katz, 2008; International Labour Conference & Internationales Arbeitsamt, 2002; Lee, 2001; Meelissen & Drent, 2008; Smeets, 2005). The benefits that technology has within education are being recognised more frequently as the world is changing to become more technologically based. One of the most valued inputs that technology integration may hold for South African schools is that, technology is seen to be the means through which learners can start taking charge of more opportunities, which will enable socio-economic and lifestyle changes (Adebakin et al., 2011; Blignaut, 2009). With these benefits in mind, the step forward with integrating technology more within the classroom seems obviously advantageous.

However, concerns of technology also apply, and should be considered when trying to encourage this integration. Some of these concerns include South African schools lacking in access and resources in general, lack of training for teachers, teachers becoming over reliant on technology to do the teaching, and the violation of privacy and privacy concerns (Blignaut, 2009; Lowry, Cao, & Everard, 2011; Lumadi, 2011; Pelgrum, 2001; Turner & Dasgupta, 2003). These are important concerns that not only have the ability to dissuade parents from accepting and encouraging technology use, but also from welcoming this change from the government. These concerns however may be less concerning for the state in light of one of the biggest barriers; acceptance of technology. For children to fully become functional with the use of technology within education, they need to accept it and view it positively (Blignaut, 2009; Bovée et al., 2007; Zhang et al., 2015). Any reservations regarding the use of technology may hinder the success of this move towards the integration of technological devices, and this should be monitored since it is seen to be potentially one of the most important moves forward for the economy.

Although The White Paper on e-Education (Department of Education, 2004) seems to be hopeful in integrating technology in the classroom, it is only today, more than

ten years after its publication, that the move forward with regards to technology within the classroom is visible. This is not to say that there were absolutely no technological devices within education; however, presently there is a stronger move towards learners being able to use technology within the classroom. This is not limited to only teachers using it, and learners merely using it for typing. This move is towards children using technology in their own education, by engaging with it. This was introduced to some government schools, as intended years ago, and is now of paramount importance (Department of Education, 2004; Gauteng Infrastructure Development, 2015; Goldin & Katz, 2008). Although this move towards technology in education is important, parents play a significant role in this integration and the possible success or failure of this movement, and it is important for us to remember that attitudes of parents may be impacted by various different things.

Parents' SES and ability to afford technology may impact their attitudes towards technology based on what they have access to. Private schools and government schools have a different demographic (most times), since private schools are generally more expensive than government schools (The Conversation, 2015). Having noted this, it is plausible that the majority of those children within private schools will have increased access to technology, both at home and school. These families are generally better-off than those within government schools, although this is not always the case.

The parents who can afford to put their children in private schools generally would have more technological access at home and better technology integration in their workplace (Domagalski, 2015). If this is true, then parents with more exposure to technology may have a different view to those who do not (sometimes attributable to SES), and may ultimately impact how their children will come to use and accept technology, as well as their access to technology. However, it is important to remember that parents sometimes opt to send their children to 'good' government schools despite their capacity to send them to private schools. Here, it has been pointed out that parent's SES may have an impact on the access their children have to technology, and possibly the attitudes they adopt towards technology within the educational space.

2.6. The Smart Schools Project

On the 14th January 2015, the Smart Schools Project was introduced in seven schools, within under-resourced communities in Gauteng (Falanga, 2015; Gauteng Infrastructure Development, 2015; Sapa, 2015). This project aimed to implement technology within “376 schools, 1800 classrooms, 56 000 learners and 351 educators” within Gauteng, who are not considered private schools (Gauteng Infrastructure Development, 2015). Within this project currently being undertaken, it should be noted that students have started to be introduced to types of technology within their final year of primary school (Falanga, 2015; Sapa, 2015). Thus, it is important that one focuses on the perceptions of parents with children who are within primary schools.

The aim of this project is to bridge the gap in education through the introduction of technology in the classroom; and to enhance students’ skills, so that they might be as prepared for their futures as their currently more privileged counterparts, and gain valuable skills and abilities (Falanga, 2015; Heckman, 2006; Sapa, 2015). This project addresses a fundamental need that De Beer (2007) raises which is,

Knowledge should become our main focus and *not* poverty relief and this can be done by not just decreasing socio-economic status (SES) but by teaching skills to children who do not have the opportunity to learn them because they are in an underprivileged community with limited access. (p. 198)

The point De Beer (2007) and Goldin and Katz (2008) make is that it should not be about how to fix poverty, but rather how to produce knowledge and teach skills that will make a more thriving and knowledgeable community. This will be based on what we have the opportunity to know, and the skills we have obtained, which should be the same regardless of the type of school one may attend.

Since using technology in the classroom is becoming more and more prevalent within South African schools, it is important to understand how technology acceptance occurs, and why it is important to understand, since it is being used to optimise and standardise education. Even though this project seems to be respectable, there are always barriers that one should be cautious of when implementing big projects such as these. Two of these barriers associated with

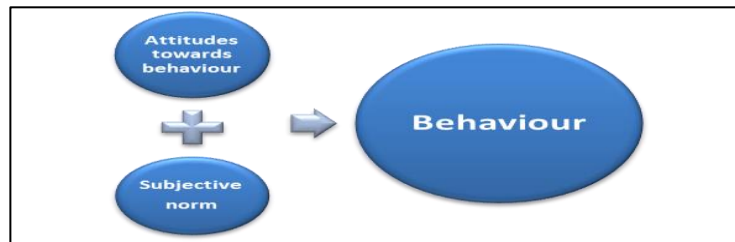
technology integration in education is around attitudes and influence (Panda & Mishra, 2007; Schneckenberg, 2009). These two barriers stipulate that people's attitudes are intrinsically linked to how they accept and use technology, and how they are influenced to accept or reject technology by influential stakeholders. Since these are two barriers that have been identified, perceptions of technology are important, as they ultimately will influence one's usage and acceptance of technology. Therefore, the Theory of Reasoned Action Model and the Technology Acceptance Model, which are the theoretical basis of this study, will be elaborated on further.

2.7. Theory of Reasoned Action (TRA) and Technology Acceptance Model (TAM)

2.7.1. Theory of Reasoned Action (TRA). Within psychological research, a model based on understanding persuasion, action and the decision making process, was established and termed the Theory Of Reasoned Action (Fishbein & Ajzen, 2011). This model prides itself on understanding actions based on the processes involved with decision making, which has its roots in psychological theory.

According to this theory, it is intention, belief and pre-existing attitudes that influence how people end up behaving, which has made it one of the most powerful models in understanding behaviour (Venkatesh, Morris, Davis, & Davis, 2003). Here, people's intentions to use technology, accompanied by their beliefs around technology, and their pre-existing attitudes towards it, would guide them into how they will use technology. Along with this, is considering how their behaviour with technology will interact with the 'subjective norm' perception (Fishbein & Ajzen, 2011). This subjective norm aids pre-existing beliefs by taking into consideration how other people view their own use or behaviour with technology (Fishbein & Ajzen, 2011; Venkatesh et al., 2003). This model is plausible, but alone fails to take into consideration how people experience technology, and their current attitudes. Therefore, this model alone fails to recognise the powerful perception of how usefulness can affect action.

Figure 2.1 TRA model



2.7.2. Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is an extended model for TRA, that explains how perceptions towards technology influence the ways in which we use technology (Vishwanath, 2015). In particular, this model prizes usefulness and ease of use.

It is a model that seeks to understand the “intention and use” of technology (Vishwanath, 2015, p. 316). This model formulates a theory of how people come to use technology, by examining how useful or not it is (Vishwanath, 2015). According to TAM, “the perceived ease of use and perceived usefulness” are that which ultimately predicts how people accept and use technology (Vishwanath, 2015, p.317). Here, if people find technology easy to use and useful within their lives, they will tend to adopt and accept it. Some have noted that TAM shies away from attitudes as being a mediator (as was seen in TRA) and rather looks as acceptance as the end result (Dillon & Morris, 1996). This is an important factor since ultimately the aim is to understand attitudes, since attitudes play an important role in understanding acceptance.

Figure 2.2 TAM model



Although there are several models that have proceeded the TAM, for example the United Theory of Acceptance and Use of Technology model (UTAUT) (Venkatesh et

al., 2003), TAM seems to be the most equipped in order to answer our questions and aid in how we understand parents' use and the effects on their children. This UTAUT model's vision was to join all theories of technology acceptance to have one coherent way in which to explain and understand people's intentions of technology use and the ways in which they will come to conduct their use with technology (Venkatesh et al., 2003). By doing this, the UTAUT may have lost distinctiveness and importance of perceived usefulness and perceived ease of use that underlies TAM and can be used to understand at a very basic level how parents' perceived ease of use and perceived usefulness can have an impact on children's lives. With this in mind, this research will use both TRA and TAM models, such that it is able to serve as a better guideline through incorporating the best of both theories, to understand how parents will influence their children's use of technology in the primary classroom.

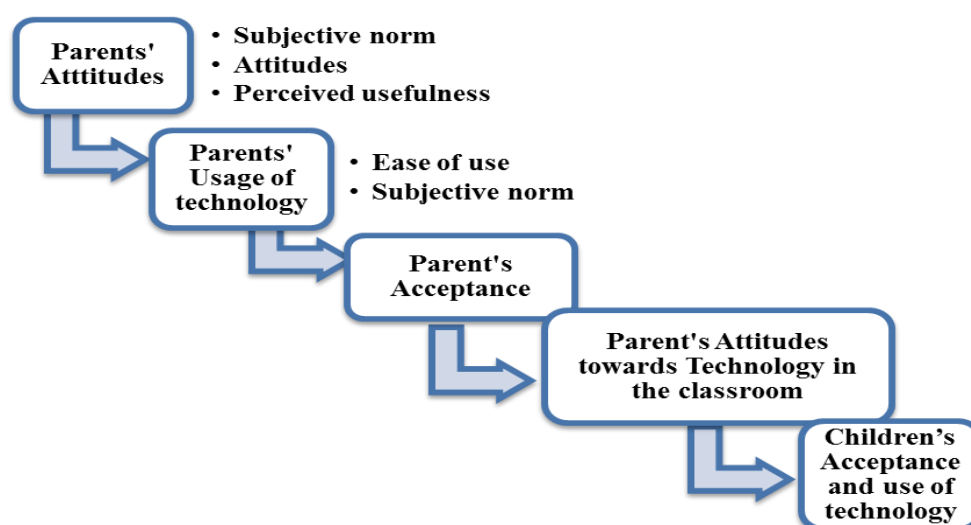
2.7.3. The Best of TRA and TAM. Since this research is focused on understanding parents' use and acceptance, and how this will guide their children's use of technology, it is important to use TRA and TAM models in a way that will help us understand the role of parents in their children's education.

Using TRA's acceptance attitudes (beliefs and intentions), with TAM's perceived usefulness and ease of use (related to competence), parents' acceptance attitudes could be understood better (Dillon & Morris, 1996; Fishbein & Ajzen, 2011; Terry, Gallois, & McCamish, 1993; Vishwanath, 2015). This was done in order to determine the attitudes parents have on their children's use of technology, and the influence that may accompany these perceptions.

Together these two models have the potential to unlock how parents themselves use technology through their attitudes, competence and perceptions of usefulness, and ease of use, and aid in understanding how they feel about technology being introduced in the classroom. This will ultimately aid in understanding children's acceptance and use of technology based on their exposure to their parents' beliefs and attitudes towards technology.

Another reason for adapting these models instead of just using the exact same model, is due to the fact that South Africa is a very diverse and different context that may not always allow for this automatic applicability to occur (Laher & Cockcroft, 2014). This model (depicted below in Figure 2.3), therefore underpins this research, and is more appropriate to the needs of this research, as parents influence their children. If a parent does not see the use in technology, they may be more inclined to negatively affect their child's attitude and use of this tool.

Figure 2.3 *TRA and TAM combined model*



In the above model (Figure 2.3), combining TRA and TAM may impact the ways in which we understand how parent's use of technology may affect their children's use of technology. Parents' attitudes in this model comprise of subjective norms (TRA), attitudes (TRA) and perceived usefulness. These aspects are believed to contribute to how parents feel towards technology in their daily lives. Having a positive subjective norm, attitude and high perceived usefulness here is believed to aid in high ease of use.

Parents' acceptance influences their use of technology which is influenced by how easy they find technology to use (TAM), the people around them (subjective norm-TRA), how they adopt technology and view technology integration (TRA). Together these two aspects, attitudes and use, will impact how parents accept technology (TAM). Once we are able to uncover this, along with how parents feel about their children using technology, this has implications for how children may accept and use

technology in their daily lives, as well as for educational purposes in and out of school.

Although the White Paper on e-education (Department of Education, 2004) clearly stipulates that technology should be introduced and incorporated within education, this does not always result in a willingness to do so. If people are not willing to use technology and find it difficult, they will not accept technology easily, which is potentially a problem in the educational system. Here, is it important for us to understand that, perceptions and attitudes are important in how people use technology.

2.8. Acceptance Attitudes, Perceptions and Technology Use of Parents

Attitudes and perceptions are related to one another, as attitudes are generally extensions of perceptions (Credé & Kuncel, 2008). Therefore, attitudes and perceptions will be used interchangeably within this research, as based on parents' own acceptance attitudes towards technology; they may develop particular perceptions towards technology for their children. Attitude is also closely related to motivation (Bernaus & Gardner, 2008). This indicates that having a positive attitude towards something will motivate you to use it more. Therefore, if we understand attitudes and perceptions of technology use, we can understand parents' motivation to use, and to encourage technology use to their children. It is also important to note here that in previous literature, attitudes have been positively related to usage. Here, increased use results in positive attitudes and thus more motivation to use and accept technology (Abedalaziz, Jamaluddin, & Leng, 2013; Kutluca, 2010; Miranda & Russell, 2012; Park, 2009; Sumuer & Yildirim, 2015).

Here, parents play an important role and have a huge influence on their children's interactions with technology. The premise of this research is such that, attitudes and perceptions are huge contributors of perceived ease of use, actual use and the ability to influence use since use is positively related to attitudes. By placing emphasis on parents' attitudes and perceptions of technology, spotlight is being placed on the root of how most children learn (Parcel, 1994; Wang & Neihart, 2015; Worthman, Tomlinson, & Rotheram-Borus, 2016). Parents' will promote or demote the importance of technology and technology use as they see it. If parents accept the

benefits and use of technology, they may actively promote and encourage technology's uses to their children.

Parents are seen as important players in the field of education, and following TRA and TAM, if parents are not wholly accepting of technology, they will be less likely to enforce the use of technology. This is supported by previous research that indicated that, not only are parents important in understanding, but "perceived encouragement by parents shows the strongest significant effect on the computer attitudes" of their children (Meelissen & Drent, 2008). This strengthens the need to look at parents' attitudes and acceptance of technology, in order to understand how this will affect their children's use and acceptance of technology. By using this model, it is important to understand what parents think about technology, and technology in education, as well as the use of technology both generally, and if implemented within the educational system.

By understanding how parents view and accept technology, and how this can impact their children- and the children of the country- we are actively making this a high priority within the educational system. Should we prove that this model of TAM and TRA are effective, this will have greater impact on the ways in which the government and us as a society can move forward and equip South African children with skills in order to cope and be active contributors to the economy.

2.9. Previous Research on Technology in Education

Technology in education has been around for the past few years, and is important in understanding the ways in which it has been understood worldwide. This will help one to see the trends compared internationally, and situate South Africa within those trends.

In a study conducted in Cyprus, it was found that principals within primary schools are positive about ICT being incorporated within the educational system (Papaioannou & Charalambous, 2011). Various studies done worldwide have been done on teachers and students, and have also reported positive findings in regard to how technology is perceived and expected to increase the motivation of students (Bovée et al., 2007). These are encouraging findings which will enable redressing

inequality, and it implies that the integration of technology in the classroom will address issues of motivation, which is essential for academic success.

Within South African schools, studies have reported high school students having positive opinions towards technology, both as a subject and as a resource, which may lead to an increase in overall positive attitudes towards education as a whole, should technology be integrated into the system successfully (Muller, Gumbo, Tholo, & Sedupane, 2014). Thus, there are positive findings for the prospect of technology within education, and this may provide more opportunities for learners and educators alike to engage more in knowledge production, which produces more marketable students.

In a study concerning parents' perceptions on the introduction of technology to preschool children, it was found that children are exposed to the media and cellular phones at a young age, and parents allow this with few having reservations, while others see the positive benefits that may arise (Gene, 2014). Within this same study it was noted that "parents rarely read books with their children, despite high socio-economic and educational levels" (Gene, 2014, p. 58). Bovée et al. (2007) found that parents who were more likely to support the use of technology, were those who themselves found technology useful, and they did not have concerns for the diminishing value of reading and writing. These parents were more likely to have "technologically rich environments" which resulted in these parents being more accepting of children and their use and exposure to it (Gene, 2014, p. 58). This is an indication that higher SES may affect the ways in which parents view the use of technology in the classroom to be more accepting.

Bovée et al. (2007) furthers this argument by reporting that it is evident that SES sometimes affects the ways in which attitudes towards computers are reported. This implies that, because lower SES students have little or no exposure to computers in particular, they may not be confident in the integration of computers in education.

In other studies internationally, concerns of parents and the internet have been examined, and it has been found that within the age gap of 6-12 year olds, parents are concerned about violence, cruelty of other internet users, distractions and threats

to their children's wellbeing physically and developmentally (Zotova & Zinchenko, 2014). Therefore, these are potential concerns that are important.

Participants from other studies have indicated that the need for technology is encouraged, and can be summed up through the following: "we want to have people in our community having information and being able to use that information to their benefit" (Megwa, 2007, p. 346). This represents the growing need for technology to be used within the country, and this need is one that can begin within schools.

At present, there appears to be a lack of research conducted in the South African population regarding parents' perceptions of the introduction of technology in the classroom since this move is recent and only now receiving more recognition, while other stakeholders have been examined for example teachers, students and principals (Bovée et al., 2007; Cascales, Perez-Lopez, & Contero, 2013; Gene, 2014; Hamzah et al., 2010; Hobjila, 2014; Jones et al., 2013; Kong & Li, 2009; Kristiansen, 2009; Muller et al., 2014; Ozdamh & Yildiz, 2013; Papaioannou & Charalambous, 2011; Steyn, 2013; Zotova & Zinchenko, 2014). Although other research has been identified, they have not focused and used this proposed model to understand how parents can affect their children's use of technology in education.

This leaves a gap in the literature that the researcher considers important, as parents are influential in a child's life, since they are the primary source of support as outlined by the Gauteng Department of Education (2010). To the researcher's knowledge, there is also a lack of instruments that has been designed to test perceptions of parents, especially within South Africa, and thus a new measure was required. Through this review, SES has been shown to be influential in the access students have to opportunities. In addition, the perceptions and attitudes of parents, towards technology in the classroom are vitally important to consider, since there is a move towards implementing technology in South African classrooms.

2.10. Conclusion

South African schools have different levels of resources available to them, which not only affects the skills that can be taught to children, but the difference of quality in education. This is linked to their socio-economic background. Technology is becoming increasingly more important worldwide, and is now being integrated more

within South African schools to bridge the gap of previous inequalities as an attempt to standardise education. It is important to understand how these attempts fair in the bigger picture, as well as how parents can impact their children's engagement with technology. Using a combination of TRA and TAM, parents' perceptions will be explored to understand if there needs to be more involvement to aid positive perceptions in parents towards technology, such that standardising education through e-learning can be made effective.

Chapter 3: Methodology

3.1. Introduction

In order to examine the perceptions of parents effectively, methodologies need to be applied in a way that uncovers parents' acceptance attitudes towards technology, the use of technology, and their views on their children's use of technology. The role of assessment in this study is to ensure that the measures used in exploring these factors are fair and unbiased towards any participants or groups of participants. Assessments that are performed can provide insight when used correctly and not in a harmful manner. This needs to be handled in a sensitive way since assessment in South Africa has had a damaging reputation from its misuse during apartheid (Laher & Cockcroft, 2014). To avoid the repetitions of the past, by invoking the same negative attitudes towards testing that discriminates against people, ethical and context-sensitive quantitative and qualitative methods were employed in this study and will be discussed in this chapter.

3.2. Research Design

This study employed mixed methods with an exploratory and comparative design. Within this study, qualitative and quantitative techniques were used at various points, which fall under a concurrent nested mixed methods design approach, which ensures rich and informative data (Barnes, 2012; Johnson & Onwuegbuzie, 2004). The purpose of this design is to analyse data at one point in time, employing both analyses with more emphasis on a quantitative approach, while still incorporating a qualitative element on actual perceptions (Barnes, 2012). A key element here is that, actual perceptions were not coded as would be the case with a purely quantitative design (Barnes, 2012; Creswell & Clark, 2011). Rather, qualitative aspects were incorporated to enhance understandings that quantitative aspects seek to investigate, while allowing them to emerge on their own, and taken for what it is. There was no manipulation that occurred in any of the variables, but parents' perceptions were explored and compared through open and close-ended questions (Uys & Basson, 1991).

3.3. Sample and Sampling

The chosen sample for this study was parents from both private and public school sectors. This study targeted approximately 100 parents from each sector, who have children in primary schools. The received responses were 83 parents within private schools and 106 parents within government schools. One respondent was excluded from the private school pool, as it was a repetition of another questionnaire, which was checked through noticing the replication in the qualitative responses. According to central limit theorem, 100 from each of the schooling sectors is appropriate, as it is suggested that the larger the size of the sample, the more likely the data will tend towards normality as long as a minimal number of thirty is observed (Howell, 2010). The parents within the study were between the ages 18-64 (18-24 years old: 0,5%; 25-34 years old: 9,7%; 35-44 years old: 62,2%; 45-54 years old: 23,8%; 55-64 years old: 2,7%). Of these parents, 28, 1% of parents' salaries were considered low (R0-15000), 33, 5% were considered medium (R 15 001-30 000) and 26, 5% were considered high (R 30 001 +).

Primary schools were targeted due to the fact that the Smart Schools Project starts within the primary school realm. By accessing primary school parents, parents who would potentially be integrated into this movement were exposed to this study. This was done to ensure that the parents who are being exposed to the changes are able to provide their input. Parents were asked to give feedback on if they had children in the junior or senior sector of the primary school and it was reported that 111 parents had children in junior primary (Grade 1-3) and 96 parents in senior primary (Grade 4-7). It is important to note that these numbers will not add up to the total number of parents across school since some parents may have more than one child, one in senior and primary. Of these parents, 94, 1% of parents had technology access at home, while 5, 4% of parents stipulated that they did not.

Parents were also asked about their frequency of use of technology in the workplace and 6, 5% of parents said never and not often, 3,8% said now and again, 1, 6% said weekly and 87% said daily. This shows that the majority of the parents in this study were required to use technology on a daily basis.

Purposive and convenience sampling techniques were employed, since a specific sample was chosen to be included for specific purposes, and this was convenient for the researcher (Picardi & Masick, 2013). These techniques were used as the schools chosen were based on the level of education they provided, and the types of schools that children attended. The schools that were approached were from the East Johannesburg district, and 4 schools allowed the research to take place. The government schools included in this study were well-resourced. One of these schools was situated in a low to middle SES area, whereas the other was located in a mid-high SES area. Both private schools approached were in high SES areas and well resourced. The private schools were notably more expensive than the other government schools mentioned.

3.4. Instrumentation

3.4.1. **Biographical questionnaire.** Quantitatively, a demographic questionnaire (Appendix F), which had been designed specifically for this research, addressed a number of aspects; including monthly income, technology access at home, the grade of the children (i.e. grade 1, 2, 3, etc.), type of schools the children attend (private or government) and the highest education level of the parents.

3.4.2. **Parents' Perception questionnaire.** Due to the lack of instruments available to investigate the perceptions of parents with regards to the implementation of technology in the classroom, a new questionnaire (Appendix G) had been designed. This questionnaire was designed in such a manner that it elicited both quantitative and qualitative responses from parent participants.

The quantitative questions were collated from a number of previous instruments, which addressed perceived usefulness and acceptance of technology. A questionnaire was most appropriate in this study as it was cost-effective and less time consuming, with a significant amount of data collected from a large group of people within a limited time frame (Stangor, 2011).

The questionnaire consisted of three sections which addressed attitudes, technology usage and competence, and technology and children. The first two sections were adapted from questionnaires designed by Workman (2014) and Hwang, Yang, and

Wang (2014), which are the '*Unified Theory of Acceptance and Use of Technology Measure*', and the '*Technology Acceptance Questionnaire*' respectively. These both address issues on the acceptance of technology.

The first subscale based on attitudes was adapted from '*Unified Theory of Acceptance and Use of Technology Measure*', which is based on the UTAUT model. These questions were adapted for this context to be more straightforward, reduce ambiguity, concise and to accommodate one test format such that parents do not get confused with different formats. The '*Technology Acceptance Questionnaire*' used in the usage and competence section was based on TAM. This adaptation was made to be shorter, consist of less technical computer jargon, and be less wordy and more straight forward. These two original tests were not developed in the South African context and were also not necessarily developed for this particular population, which aided in the need for it to be adapted.

Other questions that the researcher thought most fit were included. These questions were asked specifically around technology in the classroom. This was done to tailor the questionnaire and to gain an understanding of parents' perceptions on technology integration in the classroom.

Some questions on this questionnaire appeared on a 5 point Likert scale where 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree. An example question is: "*I know how to do basic level skills with technology*", where participants selected an option from 1 to 5.

To gain a qualitative perspective of the data, other questions that fell within the three sections were more open-ended, and these aimed to elicit a more in depth understanding of the three sections to understand use, ease of use and parent's perceptions of technology within education. These were analysed in a qualitative manner to get a more holistic view of parent's perceptions and attitudes.

The questionnaire took approximately 30 minutes to complete. This questionnaire was piloted on approximately 10 parents, and then used for the study. Reliability and validity statistics were conducted on the instrument before administration to the sample group and was found to be acceptable (this will be elaborated on in Chapter 4).

3.5. Procedure

Before the study was carried out, ethics clearance was received from the University of the Witwatersrand (Appendix A: Protocol Number: MPSYC/15/005 H), and permission was required from other entities such as the Gauteng Department of Education (GDE) and school principals, depending on the type of school. The GDE provided permission for this research to be carried out at selected government schools (Appendix B: Reference: D2016/120), while for private schools, consent from the schools' principals was considered sufficient, unless otherwise stated by the individual schools.

Information letters were then sent to the principals (Appendix C), and their consent had been obtained (Appendix D). Following this, information letters (Appendix E) were sent out to parents, informing them of what the research entailed, as well as inviting them to participate further. Once parents accepted the invitation, questionnaires were distributed and collected in a box, which was made available in the reception area of all schools, where completed questionnaires were posted. When completing the questionnaire, parents completed closed-ended questions that were analysed quantitatively and open-ended questions were analysed qualitatively. The information was collected was analysed using SPSS and thematic content analysis, and the results appear in chapter 4.

3.6. Data Analysis

Once the data, which was specifically quantitatively orientated, had been collected and captured into SPSS (Statistical Product and Service Solutions version 23); it was analysed using descriptive statistics, as well as inferential statistics. Using descriptive statistics which summarised the data, a pattern in the distribution of the data was produced and seen (Howell, 2010). From this, a better understanding of the data was formulated, while the measures of central tendency and measures of spread gave more information about how parents perceived technology, as well as how this affected their willingness for their children to be exposed to technology at an early age.

Since SES is not purely an income based measure (as pointed out in Chapter 2), SES was not only measured by salary (medium, low and high), but the types of schools children were able to attend factored into this. Private schools were considered to be indicative of higher SES since children were able to receive better resources through being at these schools and presumably having better lifestyles and opportunities.

In order to assess the difference in acceptance, usage and perceptions of technology in the classroom, independent samples t-statistics were conducted, to determine if there was a difference based on the types of schools children were enrolled in. This technique was appropriate since parents could not be matched; however, they could still be compared against each other to determine if there was a statistically significant difference between the variables based on school types (Howell, 2010).

In order to uncover an understanding of parents' SES and school type Chi-square test was calculated. To assess the perceptions and perceived usefulness of technology and technology in the classroom, Pearson's correlations coefficients and multiple regressions were calculated to investigate whether there was a relationship between SES and perceived usefulness, as well as acceptance of the introduction of technology.

Qualitatively, thematic content analysis as per Braun and Clarke (2006) was used in order to analyse the qualitative data. This was used on the open-ended questions in the questionnaire that asked parents to elaborate and describe their attitudes and perceptions. Definitions, attitudes and perceptions constituted the qualitative data. This was not considered quantitative data since parents' responses were analysed in a qualitative manner, to elicit a deeper and meaningful understanding. Main and sub-themes were identified in order to understand what parents were saying and how they portrayed their attitudes, perception, concerns and feelings towards technology integration with their children.

The quantitative findings, along with the themes uncovered were used to inform each other and understand beyond the numbers, what parents feel. These two types of

data analysis informed the research aims, and gave a clearer understanding of how parents perceived technology, how they used technology and accepted it, as well as if certain aspects were associated with certain attitudes and perceptions.

3.7. Ethical Considerations

The chosen sample was not a vulnerable sample; however, there were still some ethical matters to be considered to protect the participants, the researcher and the discipline, due to its reputation in South Africa (Laher & Cockcroft, 2014). First, as noted earlier, ethical clearance was sought from the University of the Witwatersrand (Appendix A: Protocol Number: MPSYC/15/005 H). In addition, permission was sought from the GDE. Following this the principals of the selected schools gave their written consent to conduct the study at the chosen schools (Appendix D), prior to establishing contact with the parents through information letters (Appendix E). Parents' informed consent was assumed through the posting of their questionnaires.

Once the consent letters had been signed by the principal, parents were able to complete, withdraw or not complete the questionnaires as was their own choice. It must however be noted that once the questionnaires had been collected, parents forfeited their right to withdraw, seeing as there were no identifying markers on questionnaires and consent was assumed through the posting of the questionnaire. This research expected no harm to be caused to the participants. All of this information was available on the information and consent letters, which parents and principals received; explaining the purpose of the study, as well as important considerations regarding anonymity and confidentiality.

As parents had the option of completing the questionnaires anonymously, anonymity was ensured in the final research report, and/or other publications that might arise from this study. In addition, the parents' responses were kept confidential and were only looked at in relation to the responses of other parents. The identities of the schools were also kept confidential. Information sheets stated that participation in this research was completely voluntary, and no consequences would result in no participation or a withdrawal of participation.

The results of this research will be made available through a summary of the findings of the research, which will be placed on the school's notice boards or in the school

where it is available. Parents were advised to contact the researcher for findings of the research should they wish to, which could be done with the contact details provided. Access to the results will be made available online to the University's members, and may result in publication which will be made available upon request. Furthermore, the raw data was converted to digital format, and all identifying particulars were removed. The raw data will be kept in a locked cupboard at the University of the Witwatersrand, with the digital data stored on a password protected computer. The data will be destroyed after 5 years.

In terms of the ethical principles followed, principals and parents were clearly informed about the purpose of this research and what this research aims to do and the possibilities that may arise from this research. Participants were clearly informed about what was expected of them, as well as how the data will be used. Confidentiality and anonymity was ensured through this research and this was clearly communicated to participants. Participants' participation was voluntary and no consequences followed their acceptance or rejection to participate in the research.

3.8. Conclusion

Assessing South Africans requires a sensitive and ethical approach in methodology and procedure, which enables the best insight into South African's perceptions. This research followed ethical guidelines, and has approached the research process with caution, despite not targeting a vulnerable sample. The methodology used was a mixed method approach, which aimed to analyse quantitative and qualitative aspects. These two approaches will come together to inform the broader question, 'What are the perceptions of parents regarding the integration of technology in primary school classrooms in South Africa?'. These aspects have been analysed using statistical and thematic analysis techniques individually, and analysed in a holistic manner and will be discussed in the chapters to follow.

Chapter 4: Results

4.1. Introduction

Within this, the results chapter, the findings will be presented which includes statistical analysis and thematic content analysis. Descriptive and inferential statistics will be presented, and thereafter the themes will be shown. In order to establish internal consistency reliability between the subscales of the questionnaire, Cronbach Alpha coefficients are reported for parents' acceptance attitudes, competence and the views of technology in the classroom. The summary statistics have been reported below to establish how the data was distributed, skewed data was transformed, independent samples t-statistics, Chi-square test of association, parametric Pearson's correlations coefficients and multiple regressions were conducted. These were done on parents' acceptance attitudes, usage and perceptions towards children's use of technology in the classroom, while themes were centred on benefits and reservations of technology.

4.2. Statistics:

4.2.1. Internal Consistency Reliability: Pilot study. Before the questionnaire was sent out to schools, an initial pilot was conducted on parents who had children in primary schools. A total of 13 pilot questionnaires were sent out, of which 10 were returned by the specified date. This amounted to a response rate of 76, 92%. This response rate was considered to be sufficient due to time constraints. Internal consistency reliability was measured across the acceptance attitudes, usage and competence and the children and technology scales individually. The results are shown below in table 4.1.

Table 4.1:

Cronbach Alpha coefficients from pilot study

Scale	Cronbach Alpha (α)
Attitudes	0.824
Usage and Competence	0.930
Children and Technology	0.953

The Cronbach alpha coefficients reported for each scale ranged from $\alpha = 0.824$ to $\alpha = 0.953$, which indicates good and strong reliability within the scales. This suggests that the acceptance attitudes of parents, usage and competence of parents and their perceptions of children and technology scales are consistent measures. This indicates that the measures are reliable. Based on these statistics, the questionnaire was distributed to the schools, and the results follow below.

4.2.2 Internal Consistency Reliability: Main Study. After the pilot had been conducted, the questionnaires that were received were tested for internal consistency reliability once again. This was done to ensure that the measure was as reliable in the actual study, as it was in the pilot. The results per scale appear below in table 4.2.

Table 4.2:

Cronbach Alpha coefficients from main sample

Scale	Whole sample α	Government α	Private α
Attitudes	0.785	0.754	0.821
Usage and Competence	0.880	0.613	0.760
Children and Technology	0.692	0.811	0.928
N=	189	106	83

The Cronbach Alpha coefficients for the actual study range between 0.692 and 0.880. This indicates that there is good reliability across all scales. The coefficients for attitudes, usage and competence, technology in the classroom for the whole sample are as follows: 0.785; 0.880 and 0.692. It must also be noted that internal reliability coefficients are higher in private schools than in government schools. These high reliabilities indicate that the items are highly consistent with each other, in the questionnaire. These high levels of consistency may be attributed to the longer

length of the test, as it is noted that the long length of a test generally results in good or high reliability (Singh, 2008).

4.2.3 Summary Statistics: Main Study. Summary statistics were obtained for each variable in the study, and is provided in table 4.3 below. These summary statistics reflect how the data is distributed about the mean, and include the mean, the standard deviation, minimum, maximum, skewness coefficient and kurtosis coefficient.

In order to assess normality, distribution analysis was done, which consisted of assessing the skewness coefficient and kurtosis statistic. When the kurtosis and skewness coefficient values were evaluated, it showed that the usage and children in technology perceptions were skewed across both normality tests, which exceeded the range of -1 and 1 where normality is considered.

Table 4.3:

Summary statistics across the whole data set

	Mean	Standard deviation	Minimum	Maximum	Skewness coefficient	Kurtosis
Attitude	3.750	0.606	1.50	4.90	-0.622	0.443
Usage and competence	3.759	0.530	1.00	4.67	-1.412	4.763
Children and technology	4.446	0.630	1.00	5.00	-1.523	4.440

N=189

It must be noted that if we turn to table 4.4 and 4.5, we can see that individually, the data was not as skewed as when the data is put together. This is understandable as when the data is put together, two supposedly different groups are being classified as being a part of one study group.

When we use the whole sample and take the skewness and kurtosis coefficient values together, skewness appears within variables usage and competence (skewness: -1.412; kurtosis: 4.763), and children and technology (skewness: -1.523;

kurtosis: 4.440) variables. Between the two measures, the skewness coefficient is a more accurate measure of skewness and normality, due to it measuring the skewness of the data and not simply the peaks of the data (Frank & Althoen, 1994; Peers, 2006). Since these scales have yielded non-normative results, they were transformed using the Log10 transformation. This was done such that parametric tests could be carried out on these measures (Peers, 2006). The adjusted skewness coefficients and kurtosis coefficients are shown below in table 4.6 and all the calculations to follow will be based on the transformed scales.

Table 4.4:

Summary statistics Government schools

	Mean	Standard deviation	Minimum	Maximum	Skewness coefficient	Kurtosis
Attitude	3.7897	0.60160	2.00	4.90	-0.589	0.266
Usage and competence	0.3295	0.09835	0.12	0.70	0.460	1.060
Children and technology	0.1520	0.15142	0.00	0.60	0.521	-0.808
N=106						

Table 4.5:

Summary statistics Private schools

	Mean	Standard deviation	Minimum	Maximum	Skewness coefficient	Kurtosis
Attitude	3.7004	.61209	1.50	4.70	-0.676	0.724
Usage and competence	0.3519	0.09380	0.12	0.65	0.165	0.736
Children and technology	0.1719	0.16888	0.00	0.70	0.491	-0.647
N=83						

Table 4.6:

Log 10 Transformed variables.

	Transformed Skewness coefficients	Transformed kurtosis
Usage and competence	0.315	0.784
Children and technology	0.520	-0.683

The above shows that although not completely normalised, the coefficients fall within the range for normality to be considered.

4.2.4 T-Statistics. Independent t-statistics were conducted to establish if there was a difference in acceptance, usage and perceptions of technology in the classroom. This was based on the types of schools parents had their children enrolled in.

Table 4.7:

T-Statistics showing the difference in attitudes, usage and children based on school types

	<i>Df</i>	<i>t- value</i>	<i>p-value</i>	<i>Levene's Test</i>	
				<i>F</i>	<i>p-value</i>
Attitudes	183	0.995	0.321	0.069	0.794
Usage	183	1.394	0.165	0.259	0.611
Child	182	1.022	0.308	2.688	0.103

From the above table, the assumption of homogeneity was met for acceptance attitudes using Levene's Test ($F_{2, 183} = 0.069$; $p = 0.794$), usage ($F_{2, 183} = 0.259$; $p = 0.611$) and children ($F_{2, 183} = 2.688$; $p = 0.103$). The results then indicated that there was no significant difference between groups, based on the types of schools children

attended. Therefore, the attitudes ($t_{183} = 0.995$; $p = 0.321$), use and competence ($t_{183} = 1.394$; $p = 0.165$), and perceptions of children ($t_{183} = 1.022$; $p = 0.308$), did not appear to be statistically different based on types of school.

4.2.5 Chi-Square Test of Association. In order to ensure that the assumptions are not made prematurely about the sample, and to gauge an understanding of parents' SES standing (low, medium or high based on a monthly income of R0-15 000; R15 001-R30 000 and R30 001+ respectively), when broken down by school type, Chi-square test was calculated and presented below in table 4.8.

Table 4.8:

Chi-square test of association

			School Type		Total
			Government	Private	
Salary	Low	Count	38	14	52
		% within salary category	73,1	26,9	100%
		% of total			32,1%
	Medium	Count	38	23	61
		% within salary category	62,3	37,7	100%
		% of total			37,7%
	High	Count	16	33	49
		% within salary category	32,7	67,3	100%
		% of total			30,2%
Total		Count	92	70	162
		% within salary category	56,8	43,2	100%
		% of total	100%	100%	100%
			$\chi^2_{(2, 162)} = 18.008$		$p = 0.000^*$

*significant at 0.05

According to this, it can be seen that, of the respondents who answered this question, 73, 1% of the lower income SES group (total monthly income of R0-15 000) attend government schools. This is opposed to the 26, 9% of those children who attend private schools. Within the middle income band (total monthly income of R15 001-R30 000), there are more children who attend government schools (62, 3%) than those who attend private schools (37, 7%). If the split between schools based on higher SES (total monthly income of R30 001) is considered, parents send their children to private schools more often (67, 3%) than government schools (32, 7%). This shows that when parents can afford to send their children to private schools, they more than often do it. By interpreting the Chi-square coefficient ($\chi^2_{(2, 162)} = 18.008$; $p = 0.000$), it is evident that there is a significant relationship between school type and SES. This therefore stipulates that having a higher SES relates to having your children in private schooling.

4.2.6 Pearson's Correlation Coefficient. Due to the scales' normalised nature, Pearson's correlation coefficients could be conducted, to establish whether relationships exist between measures, with the exclusion of gender due to its dichotomous nature. These results are presented below in table 4.9 for government schools, and table 4.10 for private schools.

Table 4.9:

Pearson correlation coefficients for government schools (Note* Indicates $p > 0.05$ ** Indicates $p > 0.001$)

	Age	Education level	Career	Salary	Attitude	Usage and Competence	Children and technology
Age	-	0.195*	0.040	0.400**	-0.013	0.079	0.066
Education level	0.195*	-	-0.078	0.552**	0.305**	-0.275**	-0.198*
Career	0.040	-0.078	-	-0.048	0.003	0.004	-0.132
Salary	0.400**	0.552**	-0.048	-	0.251*	-0.268**	-0.054
Attitude	-0.013	0.305**	0.003	0.251*	-	-0.448**	-0.633**
Usage and Competence	0.079	-0.275**	0.004	-0.268**	-0.448**	-	0.461**
Children and technology	0.066	-0.198*	-0.132	-0.054	-0.633**	0.461**	-

All correlational relationships were conducted in order to explore which variables were related to each other out of interest within this research set and not necessarily just to answer the questions posed previously. The above table shows that there are several correlations between factors namely age, educational level of parent, career, salary, attitude, usage and competence and children and technology. The significant relationships within government schools are as follows: age and education level ($r=0.195$; $r^2=0.038$; $p=0.049$); age and salary category ($r=0.400$, $r^2=0.16$; $p=0.000$); educational level and salary category ($r=0.552$; $r^2=0.305$; $p=0.000$); educational level and attitude ($r=0.305$; $r^2=0.093$; $p=0.002$); educational level and usage ($r=-0.275$; $r^2=0.076$; $p=0.005$); salary category and attitude ($r=0.251$; $r^2=0.063$; $p=0.016$); salary category and usage ($r=-0.68$; $r^2=0.462$; $p=0.010$); attitude and usage ($r=-0.448$; $r^2=0.201$; $p=0.000$); attitude and child ($r=-0.633$; $r^2=0.401$; $p=0.000$); and usage and child ($r=0.461$; $r^2=0.213$; $p=0.000$). This indicates that there are relationships between the scales themselves, and between the scales and educational level.

Table 4.10:

Pearson correlation coefficients for private schools

	Age	Education level	Career	Salary	Attitude	Usage and Competence	Children and technology
Age	-	-0.136	-0.125	0.240*	0.041	0.092	-0.111
Education level	-0.136	-	-0.270*	0.136	0.125	-0.105	-0.005
Career	-0.125	-0.270*	-	-0.192	0.045	0.084	-0.094
Salary	0.240*	0.136	-0.192	-	0.125	-0.078	-0.159
Attitude	0.041	0.125	0.045	0.125	-	-0.589**	-0.622**
Usage and Competence	0.092	-0.105	0.084	-0.078	-0.589**	-	0.470**
Children and technology	-0.111	-0.005	-0.094	-0.159	-0.622**	0.470**	-

Note: * Indicates $p>0.05$ ** Indicates $p>0.001$

Within the private school sector, there were correlations between age and salary category ($r=0.240$; $r^2=0.058$; $p=0.045$); education level and career ($r=-0.27$; $r^2=0.075$);

0.073; $p= 0.016$); attitude and usage ($r=-0.589$; $r^2= 0. 346$; $p=0.000$); attitude and children ($r= -0.622$; $r^2= 0. 387$; $p= 0.000$); and usage and children ($r=0. 470$; $r^2= 0. 221$; $p= 0.000$). This indicates that there are relationships between the scales.

4.2.7 Multiple Regressions. A multiple regression was conducted in order to establish if parents' attitudes and usage predicts parents' perceptions of children's use of technology in the classroom, and is presented below in table 4.11.

Table 4.11:

Multiple regression on the perceptions of children's use of technology in the classroom.

						95 % Confidence interval for β	
	Mean	Standard deviation	t- value	p- value	Standardised β	Lower bound	Upper bound
Attitude	3.752	0.606	-7.867	0.000*	-0.523	-0.717	-0.103
Usage	0.339	0.097	2.954	0.004*	0.196	0.107	0.537
			<i>F-value</i>	<i>p-value</i>	<i>R²</i>		
Overall Model			64.929	0.000*	0.419		

Note: * Indicates $p>0.05$ **

From the above table, we can see that the overall model is significant ($F_{2; 180}= 64.929$; $R^2= 0.419$; $p=0.000$). This indicates that parents' acceptance attitudes and usage of technology are suitable predictors of how they perceive their children interacting with technology in the classroom. In addition to this, the overall model explains 41, 9% of the variance in children and technology perceptions ($R^2= 0.419$). When taken individually, each predictor adds to the overall model through parents' attitudes ($t_{180}=-7.867$; $p= 0.000$), and parents' usage of technology ($t_{180}=2.954$; $p= 0.004$) being significant predictors of perceptions of children and their use of technology in the classroom.

4.3 Qualitative Themes

Using thematic content analysis, five main themes were identified across scripts. These include the *definitions of technology*, *reservations*, *benefits*, *technology in the classroom* and the *Smart Schools Project*. These themes have several sub-themes related to them, and further explain the data and parents' perceptions of technology.

Table 4.12:

Qualitative themes and sub-themes

Themes	Sub-Themes
Definitions of Technology	
Reservations	<i>Laziness, cheating and the need for supervision.</i> <i>Development and health risks.</i> <i>Safety, illegal and inappropriate content.</i> <i>Social communication.</i> <i>Overdependence, overindulgence and addiction.</i>
Benefits	<i>Personal.</i> <i>Environmental.</i> <i>Practical.</i> <i>Social.</i> <i>Cognitive.</i>
Technology Perceptions in the Classroom.	
Smart Schools Project	

4.3.1. Definitions of Technology. When participants were asked to provide their definitions of technology, participants' responses were categorised into three sub-themes. These were: the devices that can be considered technology, the advantages and uses, as well as an actual definition of technology.

A large proportion of definitions that were provided by parents, were examples rather than definitions, which included computers, laptops, tablets, internet access, social media, “digital equipment” and interactive whiteboards. Other parents indicated that technology consisted of a “paperless environment”, it had advantages of being an “academic aid”, it adds to “increased knowledge” by having access to information and communication, which ultimately will lead to the improvement in education. Other parents indicated that there is the added advantage of being “entertaining” and “fun”, and because of these aspects, it can be an effective tool for learning. One parent in particular indicated above and beyond this that children do not only need to be able to use technology, but they need to have Information Technology (I.T.) knowledge. In particular children should be “taught to program” and “children need to learn code C++”. This elaborates a need for more background of technological processes to be added to the curriculum, as well as an extensive use and understanding of computers which falls under the realm of computer sciences.

Other parents indicated that technology “makes things quick and easier”, “it’s the use of technological objects...to access information”, it’s a “tool that can be used to help promote human learning”, and more importantly, it’s about “learning by experience” and enhancing learning. Another interesting take was that parents describe technology introduction through “moving the younger generation in modern times”, indicating that there is this notion of technology being associated with being modern, young and relevant. Although these definitions have positive associations, parents also had reservations.

4.3.2 Reservations. Participants expressed their reservations on the use of technology and their children with several categories such as laziness, cheating, the need for supervision, safety, illegal and inappropriate content, development risk, social communication, overdependence, overindulgence and addiction.

Laziness, cheating and the need for supervision. One of the reservations that were brought up by parents was that of laziness. This laziness that was noted was not merely the laziness of children that can often accompany regular technology usage, but also laziness of teachers. Parents have indicated that teachers must not take advantage of this tool by using it as a substitute for teaching, but rather as a tool

“used in conjunction with other teaching” and basic education. In other words, this must not replace education in the classroom since “technology may encourage a habit of laziness” while “educators become so dependent on technology”, which may encourage less “teacher-student interaction”. Another aspect that was mentioned was that technology may be used as a means of cheating and plagiarism, which needs to be monitored. Children need to be supervised when engaging in technological use, as there is increased risks to safety with the availability of illegal and inappropriate content from the internet.

Safety, illegal and inappropriate content. Another reservation was the concern for the safety of children, and the inherent threat that technology poses with the availability of “illegal” and “inappropriate content” that is accessible from the internet and through using technology. This is a concern for parents due to the fact that children are being introduced to technology from a young age, and once they learn how to explore the internet, they have access to everything the internet offers, whether they are only taught for academic purposes or not. With the introduction of technology, children will also be forced to carry around electronic devices and have technology within their possession, which means that there is increased risk of theft and exposure to crime for children. Not only does this pose a threat to the theft of devices, this also has implications for the loss or theft of information which parents raised as a concern. These concerns are due to and associated with the “high cost” associated with technology due to the “cost of maintenance due to accidental, theft or negligence”. *Development and health risks.* Risks to children’s’ health and wellbeing are always of most concern for parents which is understandable. This includes cognitive development risks such as shortened attention spans, the ability to check spelling without the use of spell-check, count and “superficial knowledge”. This superficial knowledge comprises of being able to look up things on-the-go, and not understanding the complexities of it. Other types of risks include physical and developmental skills. Physical risks include the lack of development of “gross and motor skills”, due to children playing computer games and not physically engaging in activities and play with other children. As well as not having the capacity to use technology in an ergonomically designed work-space. It is further noted by parents, that children should not use technology to “replace basic skills” such as “counting”,

“spelling”, reading books and thinking for themselves. These risks go hand in hand with the lack of developing social communication skills, and how to interact with people.

Social communication. Communication is a development skill that we learn when we are younger, and many parents are concerned that technology may hinder the development of this skill. Of main concern is communication between teacher and learner, peers, “human interaction” and “social skills”. This shows a concern with technology which has the ability to hinder social communication and interaction with people. This is often associated when there is an addiction, overdependence and overindulgence with technology, which leaves no time for communication skills to develop and be enforced.

Overdependence, overindulgence and addiction. Some parents have indicated that technology should only be used when “appropriate and necessary” such that it avoids an overdependence, overindulgence and addiction. Addiction and distraction were concerns from parents who indicated that children are at risk of becoming addicted to technology, and being distracted from their school work. This idea of being over-reliant on technology was a concern for many parents and one parent also suggested that this reliance on technology can cause an increase in “impulsivity”. Other types of overdependence, which is specific to South Africa, was that of being reliant on technology all the time has implications for when there is no electricity. This implication is then, that no learning and interaction takes place if people move away from learning basic skills, and rely solely on technology to do and store everything. This is interesting as not many parents mentioned this issue, and it is a current issue that South Africans have to face due to load shedding.

4.3.3 Benefits. From the data, parents illustrated that technology also has benefits, and that these benefits range across various aspects. These different benefits are: personal, social, practical, environmental and cognitive.

Personal. On a personal level, technology has the advantages of providing learners the opportunity for “personal growth”, since technology not only enhances independence, but also allows for emotional development. Linked to emotional

development, one parent said that technology has the ability to “build confidence”. This can be seen through this independence that technology allows for, and the availability of various resources through different technological tools.

Social. Some of the social benefits that are noted of technology are that of active engagement, interaction with others world-wide, and the ability to develop skills that are far reaching. Parents have also noted that we have to be able to adapt to the changing world “that is fast becoming technologically advanced”. This can be seen as a social benefit since everyone is becoming increasingly more technologically savvy, and thus communication and information is readily available.

Practical. Technology has practical benefits, and this has been shown through parents mentioning efficiency, internet use, technology being a “research tool”, and exposure to more knowledge and sources of knowledge. It is also less expensive in the long run, it saves time, it allows fast development, increases accuracy and “makes learning fun”. Through these mentioned practical benefits, one can see that technology is seen to be efficient and make life simpler and easier. Parents indicated that tasks became easier with the introduction of technology, involved less chance of human error and more accuracy of data and information. Some parents went as far as saying, “I cannot comprehend how people function without technology in day-to-day life”, and that they themselves “cannot function effectively without the use of technology”. This shows that technology has increased practicality in every aspect of their life. As practical as it can be, few parents noted that technology is not only beneficial in making things simpler, but that it plays an important role in being “environmentally friendly”.

Environmental. Some parents indicated that technology, and the introduction of it, is useful and necessary due to its paperless aspect. This is shown through parents motivating that, by going paperless, or striving towards it at least, is not only beneficial for us on a personal level, but on a larger global scale. This is an important finding suggesting that parents not only look at technology from their personal perspective, but from a more holistic picture. Moving on from this, cognitive benefits stem from making technology successful. It is through its use, that we can become successful and knowledgeable.

Cognitive. From a cognitive perspective, parents feel that technology provides access to immediate knowledge, it “encourages creativity”, it promotes “independent learning”, it evokes “cognitive stimulation”, and it enables a “reinforcement of learning” and makes learning engaging by being fun and exciting. Using technology for these purposes enables cognitive development and thinking within children, and thus has a cognitive purpose. Through technology, parents think that technology holds a cognitive benefit that children may very well need to cope within this changing environment, where we rely on technology more and more.

4.3.4 Technology Perceptions in the Classroom. The overall perceptions of technology that were expressed by parents were balanced, and these included concerns and risks, technology in the workplace, technology in everyday life, technology around children and the uses of it. Not only did technology perceptions remain stable and positive within the workplace and life, it also remained positive with regards to the use within the classroom.

Overall, perceptions of technology encompass both good and bad aspects. However, there was more pull towards being positive about technology, and it being introduced within classrooms. Although parents praised the use of technology, parents assert that there still needs to be supervision when children use technology. One parent elaborates that, the “benefits outweighs disadvantages. It is the way of the future of the classroom”, while another parent suggested, that “if introduced correctly, it can be beneficial”. Through these, one can see that technology is good, but needs to be used in moderation, and that it must not be a replacement for formal education. Technology allows for helping children to “compete at a global level”, and it is a “brilliant vehicle for imparting and testing skill, knowledge, abilities and competencies”. Here, parents recognise that there is more benefit in technology, and that it does not just have immediate benefits, but that it has long term benefits. It is not only about long term benefits, it is about being modern as suggested by another parent through: “it is important that we keep up with the practices of first world countries”, and technology use is the means by which this can be done. The initiative, which entails the move towards better integration of technology in the

classroom, is introduced by the Gauteng Department of Education, which is the Smarts School Project.

4.3.5 Smart Schools Project. Parents were asked if they were aware of the governments' efforts towards education, namely the Smart Schools Project. A large proportion of these parents indicated that they did not know about this project, and they had not heard about it. Others claimed that they knew, and others responded saying they would like to know more.

Some parents attempted to define the Smarts Schools Project, and some gave insightful definitions and descriptions of this initiative, which were that it "connects schools through partnerships", it's "an introduction of technology, especially those previously disadvantaged", and it is about classrooms going paperless. These descriptions were also accompanied by perceptions of this ongoing project such as, "best idea ever but it needs to be implemented fully and supported", "Go ahead Gauteng, paperless schools are superb", and others indicating that they "welcome the project, but it is sad that black schools in townships are given preference. All schools should have this privilege". Through this, most people think that this is a good initiative, and that it should be rolled out to more schools in South Africa.

4.4 Conclusion

Based on all these results, it can be seen that there is a significant relationship between parents' acceptance attitudes of technology, and the usage of technology that affects how they in turn think about their children's involvement with technology in the classroom. Coupled with the qualitative component, it can be seen that parents are generally positive towards technology integration in the classroom, but that does not stop the concerns of this affecting their children's lives. These will be understood better in chapter 5.

Chapter 5: Discussion

5.1. Introduction

This chapter is designed to discuss the findings that have been laid out in the results chapter, to elicit more insight into the evidence presented above. In order to understand how parents' attitudes towards technology and usage of technology affect their perceptions of technology in the classroom, several questions were asked which aimed to answer the broader question, 'What are the perceptions of parents regarding the introduction of technology in the primary school classroom?' The sub-questions asked evoked a deeper understanding of perceptions that concerned the relationship between socio-economic status and perceived usefulness of technology; socio-economic status and parents' perceptions of the introduction of technology in the primary school classroom, and if parents' perceptions differ in accordance to the types of schools children attend. The results from chapter 4 will be used to answer these questions, and will be further discussed from both a quantitative and qualitative perspective to understand the whole picture.

5.2. Reliability

The newly constructed questionnaire was adapted from scales that have previously dealt with the attitudes and usage of technology, which resulted in high reliability scores (Hwang et al., 2014; Workman, 2014). The results from the pilot study, and the actual study, revealed that the measure is not only consistent, but that it is useful in measuring the perceptions of parents on the use of technology in the South African context (Trochim, Donnelly, & Arora, 2015).

5.3. Parents' Attitudes, Usage and Perceptions of Technology in the Classroom

5.3.1. Private and Government Schools. According to the data provided in the Chi-square tables, it was clear to see that higher socio-economic status parents, tended to choose private schools over government schools for their children. This is likely related to the fact that many parents believe that private schooling is better for their children (Reddy, 2008). One other finding that was evident was that sometimes, lower SES parents have their children in private schools. This finding could be

explained through bursaries that are offered by schools, which reach out to the academically deserving children, despite their parents' income status, with many different programmes available (Education HCI Foundation - The corporate social investment arm of HCI., n.d). These findings further confirm our assumptions that private and government schools are in fact discriminated upon by socio-economic status. It also found that there are those few who have the opportunities to attend better schools despite the incomes their parents earn. To elaborate on this, it is not to suggest that private schools are only made up of children from higher SES households, but it is more common for it to occur as the financial demands are much greater. This relationship was tested to establish the connection between SES and types of schools to confirm the use of types of schools as an indicator of SES.

5.3.2. Relationships between Attitudes, Use and Children Perceptions.

When different school types are compared, government school relationships that occurred over and above the shared relationships were: age and education level ($r=0.195$; $p=0.049$); education level and SES ($r=0.305$; $p=0.002$); education level and attitudes towards technology ($r=0.305$; $p=0.002$); education level and usage ($r=-0.275$; $p=0.005$); SES and usage ($r=-0.68$; $p=0.010$); and SES and attitudes towards technology ($r=0.251$; $p=0.016$). Of interest, SES here was related to the use and attitudes of those parents within government schools. This indicates that SES is related to attitudes towards technology, and usage of technology within the government sector. Although the previous findings occurred within only the government sector, age and SES are related across both school types.

Upon further inspection, the relationship between attitude and SES is weak ($r=0.251$, $p=0.016$), and there is a strong negative relationship between use and SES ($r=-0.68$; $p=0.010$). The low relationship between attitudes and SES may be indicative of the convenience and effectiveness technology has to offer, which occurs regardless of SES (Turel, 2014; Zhao, 2007). These results similarly indicate that higher SES is related to having lower usage and competence scores. This is an interesting finding, as it is commonly being projected that technology is becoming more prominent in business. With this in mind, it is also common for older people to be paid more, and it could be the case that it could be explained through the fact that

older people struggle to use technology (Abedalaziz et al., 2013; Financial Samurai, 2015). This reinforces the idea that there is a growing need for technology competence skills at school and business level, in order to cope with the technologically advanced society(Charlier, Guay, & Zimmerman, 2015; Davies, 2011). It is also noted that prolonged exposure to technology is more likely to result in proficiency, higher usage and competence levels (Huang & Yang, 2014). With this in mind, some parents are not accustomed to technology and learning technology quickly and it is understandable that some parents would have a negative relationship with usage. Through this, there is also a need to keep promoting technology integration within the primary school phase as is the plan, since the world is moving toward this new era, and we want to see growth in the new generation, the economy and the country.

The relationships which remained consistent, across schools, that were related to the scales were: attitudes towards technology and use of technology (Government: $r = -0.448$; $r^2 = 0.201$; $p = 0.000$ and Private: $r = -0.589$; $r^2 = 0.347$; $p = 0.000$); attitudes towards technology and perceptions of technology in the classroom (Government: $r = -0.633$; $r^2 = 0.401$; $p = 0.000$ and Private: $r = -0.622$; $r^2 = 0.387$; $p = 0.000$); and the use of technology and the perceptions of technology in the classroom (Government: $r = 0.461$; $r^2 = 0.213$; $p = 0.000$ and Private: $r = 0.470$; $r^2 = 0.2209$; $p = 0.000$). With these in mind, in government schools attitudes could be explained by use of technology by 20%, while in private schools, attitudes were explained by use by 34,7%. Here attitudes and use held the stronger relationship within private schools. When looking at attitudes and perceptions of children and technology we see that the relationship was similar across schools, with government having the stronger account of this relationship (40, 1%), over private schools (38, 7%). This starts to uncover the third sub-question of the differences between private and government schools and their perceptions of technology.

Within these relationships, there is consistency in the types of relationships (positively or negatively associated) between attitudes, use and children's use of technology across types of school. Acceptance attitudes and usage were negatively correlated, indicating that the more they used technology and felt competent, the less accepting they were of technology. This could be due to people having a sense

of being over-reliant on technology, and as a result, technology taking over their lives and every aspect being too intertwined with technology (Huang & Yang, 2014; Kent, 2008; Turner & Dasgupta, 2003; Woodford, 2006). This could further be indicative of the sense that since technology enables us to do so much more through its usage, which is a benefit; they experience less positivity around the notion that their work can always follow them which can be a detriment.

Contrary to this, previous literature has indicated that technology usage and attitudes are positively related, indicating that the more you use technology, the more positive attitudes you have towards it (Abedalaziz et al., 2013; Kutluca, 2010; Miranda & Russell, 2012; Park, 2009; Sumner & Yildirim, 2015). While other research has indicated that there is no relationship between use and attitudes of technology (Al-Adwan, Al-Adwan, & Smedley, 2013). Therefore, this research stands in contrast to literature that revealed that there is a different relationship to this research, and other research that found no relationship, while within this research there is clearly a relationship. Therefore, this research revealed an interesting finding about parents' attitudes and usage of technology within this context.

This finding not only contrasts to other literature, but it adds to the understanding that other models may not work in this South African context. This result may be due to people having unpleasant experiences with technology, when they have to use it regularly (Forgas, Cooper, & Crano, 2011; Kent, 2008). This could be indicative of parents requiring more training on the successful implementation of technology, which promotes support and coherence in understanding the use of technology and how it can be used efficiently (Chen, Looi, & Chen, 2009; Turel, 2014).

In regards to acceptance attitudes and perceptions of technology in the classroom, there was also a negative relationship between the two. This indicates that a high perception towards technology in the classroom was related to having lower acceptance attitudes of technology. This is an unexpected finding, as according to TAM, TRA and other research, this should not be the case as higher attitudes should lead to better perceptions of technology (Turculeț & Tulbure, 2014; Vishwanath, 2015; Walker, Dworkin, & Connell, 2011). This however could be explained by recognising that parents may be more inexperienced than their children in

technology use, which can result in less acceptance, but they still acknowledge the benefits that technology offers for education (Abedalaziz et al., 2013; Charlier et al., 2015; Correa, 2014; Erickson et al., 2015).

Usage was positively correlated with perceptions of technology in the classroom, indicating that increased frequency of use, and feelings of competence, had resulted in positive perceptions of technology in the classroom. This could be due to the fact that parents see the benefit of technology in the classroom, through their experience and through the initiatives of schools, teachers and the government that are all invested in their children's futures (Grant, 2011; Kent, 2008; Milligan, Littlejohn, & Margaryan, 2014; Zhao, 2007). This adds value to understanding that if parents start finding technology useful and feel competent in their abilities, they ultimately will feel better about the integration of technology in the classroom. Using TRA and TAM as a framework, it can be seen that these relationships do exist, and that increasing usage knowledge and competence of parents, may be beneficial in aiding children's successful integration.

These correlations answered the first of the three sub-questions posed. Firstly, this research has indicated that there is a relationship between socio-economic status and the perceived usefulness of technology, only within government schools. This indicates that technology is seen to be more useful for those who have higher SES, only within the government school sector. This may be due to more technology integration being required more often by parents with a higher income (Iyengar, Sweeney, & Montealegre, 2015).

The second sub-question can be answered by way of socio-economic status not being significantly related to perceptions and attitudes of technology in the classroom. Further, these perceptions do not differ across government and private schools. This may be an indication that parents may not actually differ in opinions of technology based on SES, which contradicts research that SES mediates the relationship between perceptions and the experience of technology (Hollingworth, Mansaray, Allen, & Rose, 2011). This could be because parents may notice the benefit that technology can potentially hold for their children, which is not influenced by SES. Here, SES is related to usage of parents in government schools, and it is

not related to how parents perceive their children's' use of technology, regardless of the types of schools their children attend.

5.3.3. Difference in perceptions across parents. The t-statistics that were conducted showed that parents' perceptions did not differ in attitudes towards technology, usage and perceptions of technology in the classroom across school types and were fairly similar across these parents. These results aid in answering the third sub-question, which was concerned with a difference in perceptions based on the types of schools parents had their children enrolled in.

Literature has shown that there has been a rapid implementation and use of technology across industries, and this could be the reason that there are no significant differences between parents' usage across schools, and thus socio-economic status (Boljanović, Vukašinović, & Veinović, 2014; Eastin, Glynn, & Griffiths, 2007; Ioan & Raluca, 2013; Moshiri & Simpson, 2011; Ortiz, Green, & Lim, 2011). If the change transpired suddenly, parents may have seen a sudden outburst of exposure to technology, with the same limited training opportunities available to them.

Another possible reason for there being no difference in technology perceptions in the classroom is that, despite the socio-economic class parents belong to, their children's wellbeing and futures will always be of greater concern (Mapp, 2003; Rollock, Gillborn, Vincent, & Ball, 2014). This research contributes to knowledge within the South African society by indicating that the state should aim their efforts towards increasing the usage and competence of parents, such that they can help their children, rather than focusing on attitudes. This will improve parents' competence, confidence, communication, and allow them to be more involved in their children's education (Kent, 2008). This research also indicates that regardless of SES, parents think along the same lines as far as the introduction of technology in classrooms are concerned, and that training sessions and interventions should not be limited to parents within government schools, but extended to all parents, further standardising education, and bridging the gap.

5.4. TRA, TAM and the Implications for Education in South Africa

This research tested a combination of TRA and TAM concepts through the different questions asked in the questionnaire in terms of parents' acceptance attitudes, accompanied by their usage and competence of technology. This was done to evaluate if it predicted their perceptions towards technology in the classroom. It must be noted that the aim of this research was not to validate this model in the South African context, but rather to use this as a framework in order to understand how parents' attitudes may affect their children's use of technology in the classroom. Using a multiple regression model, it was confirmed that parents' acceptance attitudes and usage of technology, influence how they feel about their children's use of technology ($F_{2; 180} = 64, 929; p=0.000$). In addition to this, these results show that parents' attitudes and use of technology are predictors of parents' impressions of their children's interaction with technology.

Although the overall model was significant, there was an unexpected finding which was that acceptance attitudes negatively predicted perceptions of their children's use of technology in the primary school classroom. This was unexpected, since it went against what TAM and TRA suggest should happen (Dillon & Morris, 1996; Fishbein & Ajzen, 2011; Vishwanath, 2015). With the negative finding, it makes an interesting case with parents may be more accepting of their children learning how to use technology effectively despite their negative attitudes towards technology themselves. This speaks to the point above whereby parents may not have received the best training themselves in the swift move towards more technology integration which may account for their attitudes, but since they see the benefits that technology can offer, they are able to see the benefit for their children. This finding contributes to knowledge, as the implications of this finding is such that, parents have the ability to influence their children's use and interaction with technology, and if we are to make the Smart Schools Project as effective as it can be, we need to be aware of this relationship (Walker et al., 2011).

In the literature, there is a recognition of what can enable support and the best integration of technology, which has been shown through studies that have trained teachers on technology use and integration (Bell, Maeng, & Binns, 2013; Chen et al.,

2009). This research has the implications that, in order to have the best type of integration, there needs to be an awareness of support through principals, government and parents. This support can benefit children in the use, and the skills they will attain from this move towards becoming more technologically savvy and digitally driven. This is further supported by literature concerned with students who have indicated that more effective usage through training would enable less negative feelings towards technology use in general (Abedalaziz et al., 2013). Thus if we try to intervene in helping parents become more supportive with technology use in the classroom, usage and competence of parents need to be targeted rather than improving acceptance attitudes.

Parents are influential in the development of their children - their mannerisms, their behaviours and how they come to use certain objects, and technology is no different (Davies, 2011). This research reaffirmed these findings by indicating that parents' own technology use, and sense of competence, may influence their perceptions of technology being introduced in the primary school classroom. This is an important finding, as previous research has stipulated that it is common for children to pick up their use of technology habits from their parents' experiences of technology, which cements this research's relevance to the South African society today (Davies, 2011; Turculeţ & Tulbure, 2014; Walker et al., 2011). Positive usage may not always result in positive attitudes, since parents may not have been trained well, and they may be accustomed to doing activities prior to technology integration, but their usage and competence will determine their attitudes on the integration.

Although statistics helps us to understand the differences and relationships that occur between acceptance attitudes; usage and perceptions on children's use of technology, thematic content analysis gives us a better understanding of why those relationships occur and how they speak to each other. This will enable a more holistic understanding of how parents understand technology.

5.5. Definitions of Technology, Reservations, Benefits, Technology in the Classroom

During this research process, parents were not only confined to completing scales, but rather they were given the opportunity to voice their opinions about technology

integration in schools. Although the themes emerged as part of the questions that were asked, parents were asked to voice their positive and negative opinions to gain a better view of their perceptions of technology integration in the primary school classroom.

5.5.1. Definitions. Technology can be described in many different ways, And sometimes it is easier to provide examples of what it is, when definitions fail us, since technology is a term used for a variety of different things (Gibert & Upc, 2010; Van De Bogart & Wichadee, 2015). When asked to describe what technology is in the classroom, most parents gave examples of some devices. The most common examples that arose were: tablets, computers, iPads, internet access, and some said interactive whiteboards. With these examples, it shows that parents do have a sense of what occurs within classrooms, and it also shows that some South African schools can measure up to international schools, who also have access to these devices (Erickson et al., 2015; Turel, 2014; Zhang, Washington, & Yin, 2014).

A few parents in this study gave definitions, and these encompassed terms such as describing a “paperless environment”, it being an “academic aid” and it being about communication and knowledge expansion. One parent defined technology as, a “tool that can be used to help promote human learning”; while another parent said that it is “learning by experience”. Another parent described technology as being about the process that enables us to be constantly “moving the younger generation in modern times”. These parents have not only indicated what technology may be defined as, but that it can be seen through the benefits that technology offers. This is interesting considering that although parents had reservations regarding technology; there was a stronger association with the benefits, so much so that descriptions entailed benefits.

These notions of technology in the classroom, fit in well with those aims that the Department of Education (2004) has set out to achieve, which was to provide a tool that can be used for knowledge expansion and to build up the knowledge economy. This was also supported by research done in the field (Charlier et al., 2015; Grant, 2011; Hollingworth et al., 2011; Ortiz et al., 2011; Walker et al., 2011). This research

provides evidence that, the South African government's efforts are on par with how parents think technology should be utilised in the classroom (Charlier et al., 2015; Van De Bogart & Wichadee, 2015).

As a tool, parents noted that technology is a means through which education can come alive. This can be an interactive, "fun" and "entertaining" way in which to keep students interested. This is supported by research that enforces the notion of technology enhancing the learning experience, by keeping children interested in the classrooms and reinforcing concepts (Kent, 2008; Kiper & Tercan, 2012; Miranda & Russell, 2012; Singh & Mbokodi, 2009; Uluyol & Şahin, 2014; Zhao, 2007). This use of technology within education is one that has the potential to go beyond being a tool for catering to many different learning styles, but can also help children engage more meaningfully with the concepts being taught at school (Cennamo, Oss, & Ertmer, 2013; Kent, 2008). Further uses of this tool are noted to make life more efficient, easier and quicker, as noted by parents in this study, which too is supported by other studies (Kent, 2008; Teo, Lee, & Chai, 2008; Turner & Dasgupta, 2003; Van De Bogart & Wichadee, 2015; Woodford, 2006; Zhao, 2007). With this relatively new notion of integrating technology more in the classroom, parents views on this movement are important to consider with may involve both reservations and the potential benefits of technology.

When parents were asked about their perceptions of technology integration in schools, parents showed a positive outlook to this move forward. They did of course also express their concerns about the harmful possibilities, but there was a general sense of agreement that this integration needs to happen. Many parents indicated that as long as this move was "supervised" and "monitored", it is acceptable for the classroom and should be promoted. Research has shown that this is understandable, that parents can promote behaviours and interventions, whilst they are still weary of those same things, to ensure the wellbeing of their children (Davies, 2011; Delen, Kaya, Ritter, & Sahin, 2015; Kent, 2008; Vittrup, Snider, Rose, & Rippy, 2014).

Reservations. Reservations regarding technology use is not

uncommon, and is presented below. Parents' concerns in this research included those of laziness, cheating, safety, illegal and inappropriate content, health risks, and a lack of social communication, overdependence, overindulgence and addiction. These concerns are not uncommon in parents, which shows that it is not just a South African concern, but concerns of parents internationally (Davis, 2012; Delen et al., 2015; Erickson et al., 2015; Hollingworth et al., 2011; Shields & Behrman, 2000).

Kent (2008) noted that technology has the reputation of being confusing, providing access to inappropriate content, and eliciting a *shortcut* culture. This is not surprising that this would concern parents. Parents are responsible for their children's wellbeing and upbringing, and they do not need unnecessary harm to be introduced into their children's lives. This is also concerning due to the fact that technology is becoming more and more inescapable, and an essential part of everyday life (Huang & Yang, 2014). From this perspective, there is may be a cause for concern, however, as noted by Lowry et al. (2011), there are ways to monitor these concerns, and in some cases, even block them. This is about monitoring use, what children are up to, and it is also about teachers and parents being knowledgeable about all aspects of technology, to ensure safe and proper use of technology (Liu & Huang, 2005; Mills, 1999). Parents cannot always be at their child's side every hour to monitor their children's activity, but at least knowing that privacy settings can be managed can start easing their minds.

It's about understanding that moderation and monitoring is key to successful technological use and needs to be addressed by parents and the state (Davies, 2011; Shields & Behrman, 2000). This is an important consideration for the Department of Education and specific schools, as they should also aim to protect children as far as possible against the potential risks their parents are concerned about, in school and in the child's homes.

In terms of safety, these devices could possibly put children in harm's way in terms of theft (Delen et al., 2015). With the increase of smartphones and other

technological devices, electronics are visible everywhere (Stephany, 2015). This may also invite unnecessary attention to children, since everyone has one, and this may become magnets for crime. But these concerns are not restricted to theft, they extend to the fact that children may not know how to monitor what they share, and too much private information may be shared (Eddy, 2015). This can occur when the proper precautions are not taken to discipline, teach and monitor one's use of the internet, social media and social communication forums.

Research also suggests that health and social risks are important to consider when thinking about technology, and it has been raised again in this research (Shields & Behrman, 2000). Some social risks that children may also be vulnerable to is cyber-bullying, and this may cause children to lack the enthusiasm to want to engage socially, and parents need to be aware of this since they aren't always aware of their children's activities (Morgan, 2013; Odendaal, Malcolm, Savahl, & September, 2006). This can be prevented through close monitoring of children's activities and their presence online, both at school and at home. Beyond simply monitoring, parents are able to block certain aspects of technology and should be made aware of this. Perhaps this is also a topic that should be touched on when introducing parents to this implementation, such that they feel more comfortable with their children's interaction with technology on a day-to-day basis, not only in school, but at home.

Some of these concerns may also be due to the fact that parents themselves are not experts in using technology, and they feel a loss of control over their children's online activities, because they cannot monitor it effectively (Delen et al., 2015; Erickson et al., 2015; Odendaal et al., 2006; Vittrup et al., 2014; Walker et al., 2011). Another reason that parents may be concerned is that they may not always know how to address issues of safe internet use, which results in limited communication with their children (Erickson et al., 2015; Punamäki, Wallenius, Hölttö, Nygård, & Rimpelä, 2009). This opens up an opportunity for parents to be more open with their children, because parents will learn the ins and outs of technology. Their children in turn will be at less harm, and can rather focus on the benefits technology has to offer. There is a need here for children to be monitored and taught about correct internet and

technology usage, which needs to be taught from home, at school and more emphasis needs to be placed through media (Delen et al., 2015; Ortiz et al., 2011). There are also ways in which parents can start monitoring their children's activities and privacy settings, and this may need to be reinforced by the state.

Other concerns that arose were the access and overreliance of technology. With the challenges that South Africans face on a day to day basis, electricity cuts and access to the internet are real concerns which should not be ignored (Lumadi, 2011; Nkabinde, 1997; Pelgrum, 2001). This is not a surprising finding since parents are also concerned that if children are only taught through technology, they will be incapable of completing tasks without technology. With this in mind, the state may need to address this issue within the curriculum planning, and communicate how this integration will take place to parents, to ease their concerns. But even with these concerns and reservations regarding technology, parents are more positive regarding its' integration within this research.

5.5.2. Benefits. In terms of the benefits that technology provides, parents listed these across various spectrums, which were classed as follows: personal; social; practical; environmental and cognitive benefits. Technology was noted as being the new way in which things are done, that resonates with people on multiple levels.

The personal and cognitive benefits that parents noted was that technology allows children to become their own person, allowing for "personal growth" in terms of emotional development, independence, "creativity" , aiding in "cognitive stimulation", skill development and building confidence. These personal benefits that were noted by parents in this study, was also mentioned from other parents and teachers (Aubrey & Dahl, 2014; Bergen, 2000; Uluyol & Şahin, 2014; Vittrup et al., 2014). By increasing access to knowledge, children are able to develop themselves, learn more at both surface and a deeper level, develop and further their current skills and work independently, instead of relying on instruction when it may not be available (Correa, 2014; Correa, Straubhaar, Chen, & Spence, 2015; Levine & Dean, 2013). Parents in this study have indicated that these benefits are important, and raise

support for technology in the classroom. This may be because they see these benefits and recognise that technology is important today. This indicated that parents are becoming increasingly comfortable with the idea of technology, and this supports literature that has mentioned the encouragement of technological devices at a young age (Aubrey & Dahl, 2014). Technology is therefore already encouraged in some instances, and should be investigated in terms of its use in the classroom.

These benefits also extend to a social level, that enables children to grow and develop themselves through interaction with other peers, becoming more savvy, knowledgeable and communicate through mediums when they lack the social skills to do it in person (Boles & Winsor, 2011; Erickson et al., 2015; Punamäki et al., 2009). Through these benefits mentioned, children are allowed to become independent, and to become more sociable through social media. Other benefits that were mentioned were practical and environmental benefits that technology had to offer.

Practical benefits that were mentioned by parents in this study included saving time and being efficient. Some parents shared that, “I cannot comprehend how people function without technology in day-to-day life”, and that they “cannot function effectively without the use of technology”. These results that emerged has been found elsewhere, and communicated the same benefits(Bell et al., 2013; Charlier et al., 2015; Coklar & Şahin, 2014; Shields & Behrman, 2000). This speaks to how parents feel technology impacts their lives in a positive way, but this also related back to one of the risks of overindulgence and overdependence on technology use. This occurs due to the fact that these parents are indicating that technology is vital in their lives, and it has made them effective. The concern is that, because technology provides such benefits, children may not learn basic skills and replace them (Humble-Thaden, 2011; Shields & Behrman, 2000).In terms of environmental benefits, technology was noted as being environmentally friendly, due to the reduction of paper use and it saving the environment(Soyka, Hill, & Palevich, 2012).

From looking at the benefits and reservations that parents have, it is not hard to see that parents have a more positive outlook towards technology, and what technology

can do for their children's lives. It is important for us to take these themes one step further, to understand what these reservations and benefits possibly hold for technology in the classroom, according to parents.

5.5.3. Technology in the classroom. Results here have been informed by the benefits and reservations parents have stipulated above. Parents were satisfied that technology is being introduced into schools more, but also reinforced that this requires supervision (Makewa, Meremo, Role, & Role, 2013). Parents also expressed that technology should not replace any systems we have in place today, but enhance them through: "it must not be a replacement for formal education" and "basic skills". This concern is echoed by stakeholders elsewhere, due to the fact that technology is capable of producing knowledge, but it cannot teach, clarify and nurture children in the basic skills they require, that extend beyond the operational knowledge technology can provide (Bell et al., 2013; Bergen, 2000; Guzman & Nussbaum, 2009; Plowman, Stevenson, McPake, Stephen, & Adey, 2011).

This concern is further justified by the fact that previous research has seen that some children may not learn well solely through technology, therefore rather than technology being the only method used in the classroom, technology skills should be taught in such a way that children of all learning styles can benefit (Meelissen & Drent, 2008). Therefore, technology is seen as a tool to enhance knowledge, not be the sole producer of it. Coupled with this, is the idea that teachers too must not become over-reliant on technology and should teach. This however may not be an issue if parents are active in their support move towards this integrated culture of technology in the classroom, and if teachers are able to see the benefit in integrating teaching with technology.

It has been seen that the use of technology is valued more and more, due to the fact that parents see it as a way to make learning more fun, interactive, providing more possibilities of problem solving, and a larger knowledge base, from which children can learn as noted above through their definitions (Mueller, Jones, Ricks, Schlegelmilch, & Deusen, 2001; Schulz-Zander, Büchter, & Dalmer, 2002; Zhang et al., 2014; Zhao, 2007). Parents indicated that technology can be a tool for learning

that engages children, while reinforcing important concepts. Not only does technology have the ability to transform day to day activities, it also has the ability to transform the relationships between teachers and parents, such that children will always get the best out of their education (Hollingworth et al., 2011; Kent, 2008; Mapp, 2003; Olmstead, 2013).

It was further noted by parents, and supported by literature, that teachers must be qualified in technological uses, such that they can integrate technology effectively in the classroom (Blignaut, 2009; Liu & Huang, 2005; Mills, 1999; Pelgrum, 2001; Rahman, 2011; Smeets, 2005). So if this is the case, then teachers need as much support from parents to integrate technology effectively, but they too need to come to the party and be qualified and knowledgeable (Bell et al., 2013; Kiper & Tercan, 2012; Mills, 1999; Miranda & Russell, 2012; Sang, Valcke, van Braak, Tondeur, & Zhu, 2011; Sang et al., 2011; Uzunboylu & Ozdamli, 2011). Should this support be provided to teachers, by parents, teachers may feel more comfortable in this process of educational reform. Added to this, if parents are supportive of this endeavour, they will promote positivity towards their children, and also be there to support in terms of helping them effectively use technology. Here, we can see that technology support is valuable, and that despite the statistics, support, positive attitudes and promoting effective use through help may all be valuable for children.

There is an awareness that technology is also a means in which we can live up to the standards set out by other countries (De Beer, 2007; Department of Education, 2004). With this in mind, technology then plays a fundamental role in not only teaching children skills for the workplace, but also having the ability to lift our country's profile and greater contribution to the knowledge economy (Boljanović et al., 2014; Milligan et al., 2014; Moshiri & Simpson, 2011; Perrotta, 2013). Some parents stipulated this more outright and stated that, technology is the means in which their children can "compete globally", we can use technology as a "vehicle for imparting and testing skill, knowledge, abilities and competencies", and "it is important that we keep up with the practices of first world countries". This reinforces the idea that technology is fast becoming essential in South African schools, and that this is regardless of the SES one belongs to. Since this is seen, there should be

more moves towards making these skills more available to all children who are not afforded this opportunity. These findings also support the statistics which stipulated that although parents may have concerns, they still see the greater benefits that technology holds for their children. The beginning stages of this move is through the Smart Schools Project, and for it to be successful, we need to understand how well this is doing at the moment, and how this may impact the future of children in the country through transformation.

5.5.4. The Smart Schools Project. Within this study, there was a minority of parents that knew exactly what the Smarts School Project was, and what it aimed to do within the country. These parents described it as, connecting schools “through partnerships”, introducing technology to those who are disadvantaged, and about education becoming paperless. These are good descriptions of what the project entails, as it does encompass each of these aspects. But beyond this, it is about standardising education, and improving ourselves as a nation of thinkers that will provide growth to the workplace and the economy (Falanga, 2015; Gauteng Infrastructure Development, 2015; Sapa, 2015).

Those who are aware also commented on what they thought about this project, which included comments such as, “Go ahead Gauteng, paperless schools are superb”, which shows support for the project. Other parents indicated that it is a good project all in all, but that all schools in Gauteng should have this opportunity, and not merely those in “townships”. This shows that parents have positive appraisals surrounding the project, but that this project may be reinforcing inequality, rather than eliminating it. In Gauteng, townships only represent a portion of those underprivileged schools, and by this logic, those who do not attend these schools, no matter the circumstance, will not have the same opportunities (Statistics South Africa, 2015). One reason that this could have started out small, is to gage how well it is doing, and from there expand its grasps. One way in which to prevent South Africans from seeing this as another way, in which people are being discriminated against, is through trying to expand this opportunity to other schools.

It is concerning that the majority of parents have not heard about this, or could not describe this endeavour of the government, since the government is trying to

improve the lives of their children and some parents are not even aware. This calls for parents to be more involved in the education of their children, to support teachers and actively engage more and more with the schools. Since parents' acceptance and views on their children's use of technology did not differ across SES statistically, there is a need for all parents; despite the schools their children attend, to be more aware of the efforts for better education in South Africa. Technology is noted to be able to provide opportunities for children to develop skills, and this should not be hindered by the fact that only certain government schools will have such opportunities (Plowman et al., 2011). By this logic, the lower and higher socio-economic status groups will then have skills, and the middle class will not acquire those skills.

5.6. Overall Discussion

All in all, the take-out message from parents is that the step towards technology integration is good, and it holds benefits for their children. This was supported statistically and qualitatively, since parents still held this movement to high regard, despite their own negative acceptance towards technology. Despite the assumption that socio-economic status would impact on the attitudes and usage of parents in some way, this was proven to be incorrect as there was no difference in perceptions among parents. This comes through in the responses of parents that their child's wellbeing is the most important and if technology offers these benefits, there is no need for them to discourage the use of technology in the classroom. Here, of highest regard are their children's futures, and the benefit that technology integration brings to the table. Technology is noted to be essential in today's society, and this move is praised, since the more children engage with technology from a young age, the more proficient they become (Huang & Yang, 2014). Once children are able to become proficient in technology, despite their societal standing, they will be able to better their own lives by getting jobs that incorporate technology, moving away from the past indiscretions that apartheid left, and better their lifestyles.

It is natural for parents to be concerned about their children's well-being, and it is understandable that they may have reservations towards this change in the

education system. From these findings, parents' usage was positively related to their feelings of their children using technology in education. Since this is a finding that has emerged from this research, the state should look towards increasing the awareness and competence of parents with technology, so that they become comfortable, proficient and can support their children with this shift. With this, although positive attitudes may not be the aid in supporting children, upskilling parents are important. In light of the models used (TRA and TAM), it appears that attitudes may not be the avenue in which to place interventional importance on since it is contributing to the overall model, even though it is a negative relationship. Ensuring that parents are confident in their ability to use technology in this context is important which shows that one part of the TAM model's process is seemingly more important than the latter half of the process. Subjective norm in TRA also seems to be an important aspect of how parents come to adopt the use of technology and is evident in this research as technology use is largely affected by the importance society places on the movement.

Parents also have the responsibility to acknowledge and be aware of the state's current implementations, since it is only then that collaboration between the state, schools and parents can occur, to provide the best opportunities for the child. It is through this that the country can start moving towards redressing the inequalities of the past. It is through this that children will not be discriminated against regarding opportunities. It is a way in which we can rather look towards a more equal and skilled society. It is through skilled and knowledgeable citizens that the country can be great contributors to the global economy.

5.7. Conclusion

This chapter has explained the results of chapter 4, and has also given us the opportunity to reflect on the relationships between attitudes, usage and perceptions of technology in the classroom. It was surprising that attitude impacted perceptions on children in the opposite way than was expected in the South African context. This could be supported in the ways in which parents have described qualitatively that they do have overall concerns, but that these concerns are far outweighed by the benefits technology has to offer.

There was also no evidence to indicate that perceptions among private and government school parents for acceptance attitudes, children and usage differ. Within this chapter, the Technology Acceptance model and the Theory of Reasoned Action model informed literature that the overall model was significant. This indicated that those attitudes of parents, and their usage, are significant predictors in their perceptions of technology in the classroom. This has implications for interventions that need to target usage and understanding of technology, instead of targeting attitudes which will be discussed in chapter 6.

The qualitative findings reinforced the statistics, which indicated that parents are positive about the integration of technology in the classroom. This chapter has presented the pros and cons of how parents come to terms with deciding what is beneficial to their child. The overall perception is that technology integration is a good thing and should be done, but should also be monitored. This monitoring may need to be addressed, along with the effective usage of technology, to increase parents' acceptance of technology in their own lives, such that they can support teachers. It was surprising to find that not many parents are aware of the Smart Schools Project, and government may need to address this such that parents are more aware of their efforts. Chapter 6 will look at the key findings of this research, its implications and the way forward.

Chapter 6: Conclusion

6.1. Introduction

Within South Africa, students have varying levels of access to resources, including technology. This access to technology is determined by the types of schools they attend, and will result in the abilities and skills they are limited in developing. This study has looked at the impact of different schools and socio-economic status on parents' attitudes, usage and their perceptions of technology integration in the classroom. This chapter will outline the key findings, limitations, strengths as well as the way forward.

6.2. Key Findings

Through this research, the first of its kind, it has been proven that parents' acceptance and usage of technology, affects the attitudes they have towards the integration of technology in the classroom, across government and private schools. The attitudes, usage and perceptions of technology in the classroom were analysed on various levels, with associations they have with different factors, with each other, and how they differ when compared on a school type basis. The results showed that these three scales correlated with each other, and that there were no significant differences in these scales when compared by schools. These indicate that the types of schools parents have their children enrolled in, and by virtue their SES, does not make a difference in parents' attitudes, usage and perceptions of their children.

This research has also confirmed that parents' attitudes and use of technology predict the ways in which they perceive technology in the classroom. Through this, the technology acceptance model and theory of reasoned action model, is seen to be an adequate framework in which to work from, when understanding how acceptance and usage can affect how children may end up using technology. From these findings, it was evident that, if we are to increase the relationship between parents and the perceptions they have on technology in the classroom, we need to target the competence of technology use to parents.

Although attitudes negatively predicted perceptions of technology in the classroom, which was surprising, it could be explained through to the fact that parents' usage

may not always be accompanied by positive attitudes, in regards to the role of technology in their lives. This could mean that parents' effective use may determine how parents perceive the role of technology with their children. When the qualitative aspect of the study is analysed, there is also a strong connection as to why this may have occurred. This inverse relationship may be due to the fact that parents still weigh up the pros and cons of technology use in their own lives, and may not always be convinced, but when they have time to reflect on why this may occur with their children, they are more likely to encourage the use of technology due to the benefits regarding their futures.

Parents indicated that technology is beneficial, even though it has its downfalls. It is better for lessons, keeping children motivated, and learning through interaction and to reinforce concepts that have already been taught. Technology is not to replace teachers, but rather to enhance the learning process, and should be monitored closely. It was also indicated that technology integration requires collective support for this successful integration to occur. This means that parents' usage and competence must be increased, such that they can aid their children through this introduction of technology in the classroom.

A surprising finding was that the Smart Schools Project was ill-recognised as an intervention by the government. This indicates that parents are unaware of the government's efforts, which concerns education in South Africa. Of the small percentage of parents who knew about what the project entailed, a possibility of stigmatisation became evident. Some parents felt it was unfair that only township schools were given this opportunity of tablets by the government. This indicates a possible discrimination emerging where only the wealthy will have access to the technological skills because they can afford it, the poorest will get the skills because they were given the opportunity by the government, and that the lower-middle to higher-middle SES children will not learn these essential skills that are becoming more and more vital in the workplace. All research has its strengths and weaknesses, and the characteristic of good research is to recognise its downfalls and strengths, such that future research may understand the study in more depth which will be discussed below.

6.3. Limitations

In regards to this research, several limitations were noted, and are discussed below. The first limitation that may have had a significant impact within this research is the non-experimental nature of the research. This may be problematic as it implies that absolute conclusions, void of external variables, could not be conducted due to the lack of random assignment and strict controls. The design used in this research is limiting in the fact that no intervention was conducted in a manner that can ensure these results will be replicated again. This research also lacks randomisation which decreases the possibility of systemic error (Mead, 1990). This lack of randomisation was accepted by the researcher, since it was not believed that these greatly impacted the results, given that perceptions and self-reported attitudes and usage were measured.

The sampling strategy used within this study also had implications on the results, since the schools were selected by the researcher, which all had specific demographics already associated with them. This means that the sample could not have been randomised, and may be limited by the selection based on convenience and purpose of the research. This sampling strategy however aided in the fact that the research was more specific, and the results of the private and government schools could be coherently analysed against each other.

SES was a measure that has several limitations to it. Although the researchers' best efforts were done to operationalise this measure, there are several other measures that could have been used that may have been more concise, validated and consistent with measuring this. The ways in which SES was measured at times may have been confusing and may not have taken all aspects of SES into account.

Another limitation brought on by how SES was measured in this research was based on salaries of the person completing the questionnaire, and not necessarily the household income. The parent's income who completed the questionnaire does not always reflect the child's entire SES and lifestyle. This could have affected the crosstabs result since the total income was not taken into account when associating it with the types of schools children attend.

This research also used a number of different concepts, and the conceptualisation of technology may have been problematic and not specific enough. Although this was done to not define technology for parents and let them define it themselves, parents may have been confused at several junctures when technology was referred to and if it was simply technology devices generally or devices being used in the classroom. Leaving the interpretation to parents helped in understanding what parents thought technology was but may have prevented classroom-specific responses.

Although there were a few limitations offered above of this research, this research was useful in understanding parents and technology in the South African context and it is discussed below.

6.4. Strengths

Despite some of the limitations noted above, there were strengths within this research. A strength that has greatly contributed to the understanding of parents' perceptions is the use of the mixed methods approach. This design enabled a variety of different aspects to be analysed in a way that informed each other, and answered the question, 'What are parent's perceptions on the use of technology in the primary school classroom'.

The way in which this research was approached, ensured that parents were heard through different means. It also ensured that parents were not misrepresented by being limited in only having the opportunity to represent themselves through scales. Statistically, the data collected was not normal, but was transformed such that parametric tests could be done. This technique ensures that the test retained its power, which is a strength of this research (Howell, 2013).

This study consisted of 189 parents, which is a moderate sample size for quantitative studies, but is a considerable sample size in terms of the qualitative aspect. More qualitative responses ensured that more parents' views were heard, and by so doing this, enabled parents to become important stakeholders to teachers, schools and the government. This research has proved the relationship between parents' attitudes and usage being predictors of the perceptions of technology in the classroom. This research then has further implications that can be integrated into policy and educational sphere within South African primary schools.

An additional strength of this research was to make parents more aware of the moves that policy makers are making. Many parents were not aware of the Smart Schools Project, limiting their knowledge of the wider government initiatives stipulated by the White Paper on e-education (Department of Education, 2004). By making parents aware, parents may start to try support their children with this integration which is the start to making their children more proficient with technology use, enabling them to become active contributors to society in later years.

6.5. Implications and the Way Forward

Moving forward, to enhance our understanding of this context more, more research and funding into this type of research needs to be done. Concepts such as SES and technology in the classroom need to be more specific such that it can elaborate on this research's findings and provide more insight into how to move the South African school's system forward effectively. This will not only enable more insight into the context, but improve the policies and programmes that start to become more and more customary in education and the global economy.

The value this research adds to the body of research available is that, teachers, students and principals have been largely studied, neglecting the importance of parents. Parents play a pivotal role in their children's lives and this should not be forgotten or lost in the move towards trying to integrate technology. By doing this research, parents have been made aware of this movement and more efforts should be done to not only inform parents of this move, but assimilate them into this process such that they can offer the support their children need to become competent with technology.

Through this study, it is not only proven that the models are beneficial, but works differently in South Africa. It is also evident that, parents do play an important role, and should be studied further. This has implications for the government being able to make their technological interventions more effective. This will further enable and encourage all stakeholders in the child's life to understand the value and use of technology to its' full potential, which will positively affect the child's use and acceptance of technology.

Following this research, interventions can be implemented, aimed at all parents, on understanding the value technology adds when used to its full potential. The implications are further that, parents are being seen as more and more important in the child's education, and therefore, government can now be aware of the role that parents play. The state, along with teachers will also be able to recognise that parents are important due to their influence on their children, and that they teach their children daily about different aspects. Although implementation of technology in schools is advantageous, if parents cannot find effective use of technology in their own lives, then children may adapt that same attitude. This research has also shown that, since there is no difference in accordance to the type of schools parents have their children enrolled in, interventions should be open to all parents in South Africa.

To the researchers' knowledge, there is a limited amount of research done in South Africa at the moment, especially with the new leap towards iPad/ tablet integration. This shows the importance of parents' roles, and also the strong link between parents' technology usage and perceptions of technology in the classroom. Negative use of technology needs to be addressed, such that projects such as the Smart schools project can flourish, and more students may benefit from this move forward.

Future research may be important in investigating the different types of schools associated with low, middle and high socio-economic status, since this research was only conducted in one area and may be limited. Further research should also look towards validating a model of technology acceptance for parents within this context, such that better understandings of parents can be maintained. This research may be the first step in cementing the ways in which parents, and in turn, students will come to make use of technology. This may further result in positive skills being added to the workplace, and thus the economy.

Policy makers can gain insight in the fact that parents need to be made aware of their efforts. They also need to offer support to parents, such that parents can offer support to teachers and their children. The state further needs to recognise more that parents are important stakeholders in the child's life. Finally, policy makers should be made aware of the fact that resources within the country needs to be spread out evenly, and not to selected schools, as this is the only way to free South

Africa of a discrimination mind-set, that has moved away from race and onto socio-economic status (Murtin, 2013).

6.6. Conclusion

This research has made a number of important findings that can be used in order to understand the role of parents as an important stakeholder in education. Although there are interventions to off-set the trails of inequality left by apartheid, the government need to be careful that they do not get caught in another discrimination façade. As a society we need to be more aware of the implications of all our actions and programmes being put into place, since it is these very things that help us to grow as a society, and build a better future for the children of this country.

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Appendices

Appendix A: Ethics clearance from the University of the Witwatersrand

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT)

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: MPSYC/15/005 IH

PROJECT TITLE:

Parent's Perceptions of the use of Technology in South African Primary Schools.

INVESTIGATORS

Lauren Shunmugam

DEPARTMENT

Psychology

DATE CONSIDERED

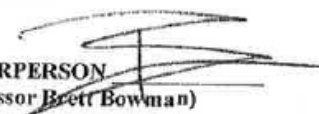
10/06/15

DECISION OF COMMITTEE*

Approved

This ethical clearance is valid for 2 years and may be renewed upon application

DATE: 10 June 2015


CHAIRPERSON
(Professor Brett Bowman)

cc Supervisor:

Mrs Adri Vorster
Psychology

DECLARATION OF INVESTIGATOR (S)

To be completed in duplicate and one copy returned to the Secretary, Room 100015, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure, as approved, I/we undertake to submit a revised protocol to the Committee.

This ethical clearance will expire on 31 December 2017

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix B: GDE Approval



GAUTENG PROVINCE

Department: Education

REPUBLIC OF SOUTH AFRICA

For administrative use:
Reference no: D2016/120
enquiries: Diane Bunting 011 843 6503

GDE RESEARCH APPROVAL LETTER

Date:	10 June 2015
Validity of Research Approval:	10 June 2015 to 2 October 2015
Name of Researcher:	Shunmugam L.O.
Address of Researcher:	52 Doorn Street; Observatory; Johannesburg; 2198
Telephone / Fax Number/s:	011 648 9775; 061 400 8396
Email address:	LaurensShunmugam@gmail.com
Research Topic:	Parents' perceptions of the use of Technology in South African Primary schools
Number and type of schools:	FOUR Primary Schools
District/s/HO	Ekurhuleni North and Johannesburg East

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved. A separate copy of this letter must be presented to the Principal, SGB and the relevant District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted. However participation is VOLUNTARY.

The following conditions apply to GDE research. The researcher has agreed to and may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

CONDITIONS FOR CONDUCTING RESEARCH IN GDE

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter;
2. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB);

2015/06/11

1

Making education a societal priority

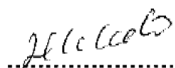
Office of the Director: Knowledge Management and Research

9th Floor, 111 Commissioner Street, Johannesburg, 2001
P.O. Box 7710, Johannesburg, 2000 Tel: (011) 355 0506
Email: David.Makhado@gauteng.gov.za
Website: www.education.gpg.gov.za

3. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned;
4. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, SGBs, teachers and learners involved. Participation is voluntary and additional remuneration will not be paid;
5. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal and/or Director must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage;
6. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year;
7. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
8. It is the researcher's responsibility to obtain written parental consent and learner;
9. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources;
10. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations;
11. On completion of the study the researcher must supply the Director: Education Research and Knowledge Management with one Hard Cover, an electronic copy and a Research Summary of the completed Research Report;
12. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned; and
13. Should the researcher have been involved with research at a school and/or a district/head office level, the Director and school concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards


.....

Dr David Makhado

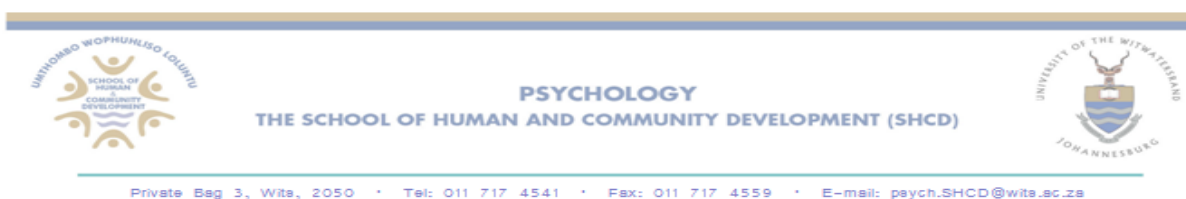
Director: Education Research and Knowledge Management

DATE: 2015/06/11
.....

Office of the Director: Knowledge Management and Research

9th Floor, 111 Commissioner Street, Johannesburg, 2001
P.O. Box 7710, Johannesburg, 2000 Tel: (011) 355 0506
Email: David.Makhado@gauteng.gov.za
Website: www.education.gpg.gov.za

Appendix C: Principals Information Sheet



Principal Information Sheet

Dear Sir/ Madam

Good day, my name is Lauren Olivia Shunmugam and I am currently completing my Masters in Research Psychology at the University of Witwatersrand. My research is in the field of the introduction of technology in the primary school classroom and parents' perceptions of this. I would like to invite the parents of your school to participate in the research as this can provide valuable information to the education sector in South Africa.

Purpose of this Research

This study aims to investigate the perceptions of parents with regards to the introduction of technology within primary school classrooms in South Africa. Specific attention will be paid to the perceptions of parents whose children are in private schools, compared to those whose children are in government funded schools to establish whether there are any significant differences in parents' perceptions and the manner in which technology is being introduced in different types of schools. A further broader aim is to help inform policy makers of these perceptions such that more interventions can be put in place to make the transition of technology in the classroom easier.

What is required of Participants?

If you agree for the parents of your school to participate in the research, I would like to address them at a parents' day or evening. During this time, parents will be informed that they will be requested to complete a demographic questionnaire and a

perceptions' based questionnaire. It will take approximately 30 minutes to complete these questionnaires. With your permission, a box will be made available in the Reception Area of your school, where completed questionnaires can be posted. Once parents have posted their questionnaires, they will not be able to withdraw from the study as there will be no identifying particulars on the questionnaires to link specific questionnaires to specific participants. Further, your school will not be able to withdraw from the study once I have collected the questionnaires, as there will be no identifying particulars of your school on the completed questionnaires. Also, we assume that by posting their completed questionnaires, parents have given their consent to partake in this study.

Voluntary Participation, Right to Withdraw, Confidentiality & Anonymity

Participation in this research is completely voluntary and parents have a right to withdraw from the study at any time should they so wish. As explained above, your school also has the right to withdraw from the study until the stage where the questionnaires are collected. Parents also have a right not to answer any questions that they may not feel comfortable with. There are no risks or benefits for participating in this study.

All information will be kept confidential and parents will not include any identifying particulars on their questionnaires which will enable anonymity. Although my supervisor and I will know the identities of the schools who will participate in the study, no information that can identify any of the schools will be included in the final research report, presentations or publications that may arise from the research.

Risks of the Research

This research foresees no harm to you or your school as this is not a sensitive topic.

What will happen to the data?

The raw data will be converted to digital format; all identifying particulars will be removed. The raw data will then be kept in a locked cupboard at the University of the Witwatersrand, with digital data stored on a password protected computer and the data will be destroyed after 5 years.

Access to the results:

The results of this research will be made available through a provided summary of the findings of the research which can be placed on the school's notice boards or in the school where it is available. Should parents wish to contact the researcher for findings of the research, this can be done with the contact details provided below. Access to the results will be available online to the University's members and may result in publication which will be made available upon request.

It will also be presented at a conference later in the year and may be published in the form of a peer-reviewed journal article.

Should you wish for the parents of your school to participate in this study, please complete the attached consent form.

Should you have any questions or concerns, please feel free to email Lauren Shunmugam or Adri Vorster (contact details given below).

I look forward to hearing from you.

Yours sincerely,

Lauren Olivia Shunmugam

Email: laurensunmugam@gmail.com

Adri Vorster

Email: Adri.Vorster@wits.ac.za

Appendix D: Principal Consent Form

School Principal Consent Form

I, _____, hereby give consent for Lauren Shunmugam to invite the parents of my school to partake in her study on parents' perceptions on the introduction of technology in primary schools. I understand that;

- Participation in this study is completely voluntary and no school or parent will be advantaged or disadvantaged for partaking in the study.
- My school and the parents have a right to withdraw from the study at any given time; however, as there will be no identifying particulars on any questionnaires, the school will not be able to withdraw from the study once the questionnaires have been collected and the data transferred into digital format. Likewise, parents will not be able to withdraw once they have posted their questionnaires.
- The identity of the school will be treated in a confidential manner and will be kept anonymous in the publication of the final research report or any publications or presentations that might arise from this.
- The final results will be compiled into a research report, which might be presented at a conference and/or multiple conferences, or published in a peer reviewed journal.
- The results of this research will be made available through a provided summary of the findings of the research which can be placed on the school's notice boards or in the school where it is available.
- There are no foreseen risks for partaking in this study.

Signature of Principal:

Date:

Appendix E: Participant Information Sheet



PSYCHOLOGY
THE SCHOOL OF HUMAN AND COMMUNITY DEVELOPMENT (SHCD)



Private Bag 3, Wits, 2050 • Tel: 011 717 4541 • Fax: 011 717 4559 • E-mail: psych.SHCD@wits.ac.za

Participant Information Sheet

Dear Sir/ Madam

Good day, my name is Lauren Olivia Shunmugam and I am currently completing my Masters in Research Psychology at the University of Witwatersrand. My research is in the field of the introduction of technology in the primary school classroom and parents' perceptions of this. I would like to invite you to participate in the research as this can provide valuable information to the education sector in South Africa.

Purpose of this Research

This study aims to investigate the perceptions of parents with regards to the introduction of technology within primary school classrooms in South Africa. Specific attention will be paid to the perceptions of parents whose children are in private schools, compared to those whose children are in government funded schools to establish whether there are any significant differences in parents' perceptions and the manner in which technology is being introduced in different types of schools. A further broader aim is to help inform policy makers of these perceptions such that more interventions can be put in place to make the transition of technology in the classroom easier.

What is required of Participants?

If you agree to participate in the research, you will be asked to complete a demographic questionnaire and a perceptions' based questionnaire. It will take approximately 30 minutes to complete these questionnaires. Please return back to the researcher when it has been completed and note that it will be placed in a box

such that responses may remain confidential. Once you have handed in your questionnaires you will not be able to withdraw from the study as there will be no identifying particulars on the questionnaires to link your questionnaires to you. Also, we assume that by posting your completed questionnaires, you have given your consent to partake in this study.

Voluntary Participation, Right to Withdraw, Confidentiality & Anonymity

Although your participation would be much appreciated as I value your input on this matter, participation in this research is completely voluntary and you have a right to withdraw from the study at any time should you so wish. However, once you have posted your questionnaire, you will no longer be able to withdraw from the study. You also have a right not to answer any questions that you may not feel comfortable with. There are no risks or benefits for participating in this study.

All information will be kept confidential and given that you will not add any identifying particulars on the questionnaires, you can remain anonymous. Although my supervisor and I will know the identities of the schools who will participate in the study, no information that can identify any of the schools will be included in the final research report, or any publications and/or presentations that may arise from it.

Risks of the Research

This research foresees no harm to you as parents or your school as this is not a sensitive topic.

What will happen to the data?

The raw data will be converted to digital format; all identifying particulars will be removed. The raw data will then be kept in a locked cupboard at the University of the Witwatersrand, with digital data stored on a password protected computer and the data will be destroyed after 5 years.

Access to the results:

The results of this research will be made available through a provided summary of the findings of the research which can be placed on the school's notice boards or in

the school where it is available. Should parents wish to contact the researcher for findings of the research, this can be done with the contact details provided below. Access to the results will be available online to the University's members and may result in publication which will be made available upon request.

It will also be presented at a conference later in the year and may be published in the form of a peer-reviewed journal article.

Should you wish to participate in this study, please complete the attached questionnaires. As noted, a box will be made available in the reception area of the school, where you can post your completed questionnaires.

Should you have any questions or concerns, please feel free to email Lauren Shunmugam or Adri Vorster (contact details given below).

I look forward to hearing from you.

Yours sincerely,

Lauren Olivia Shunmugam

Email: laurensunmugam@gmail.com

Adri Vorster

Email: Adri.Vorster@wits.ac.za

Appendix F: Demographic Questionnaire

Demographics Questionnaire:

Please tick the appropriate box:

Your Gender:

Male	
Female	

Which age group do you fall into?

18-24 years old	
25-34 years old	
35-44 years old	
45-54 years old	
55-64 years old	
65-74 years old	
75 years or older	

Your Highest Level of Education:

Primary School (Grade 7)	
Grade 8 or 9	
Grade 10 or 11	
Grade 12 or the Equivalent	
Certificate	
Higher Certificate	
Diploma	
Postgraduate Diploma	
Bachelor's Degree	
Professional First Degree Postgraduate	
Honour's Degree	
Master's Degree	
Doctorate Degree	

What is your Career Field?

Accounting Sciences	
Economic & Management Sciences	
Human Sciences	
Science, Engineering & Technology	
Agriculture & Environmental Sciences	
Education	
Law	

Other (Please Specify)	
------------------------	--

Please select which salary category (per month) you fall into:

R 0 – R 5000	
R 5 001- R 10 000	
R 10 001 - R 15 000	
R 15 001 – R 20 000	
R 20 001- R 25 000	
R 25 001- R 30 000	
R 30 001- R 40 000	
R 40 001- R 50 000	
R 50 001 +	

Does your child, who is in Primary school, attend a government funded school or a private school?

Government- funded school	
Private school	

What grade is your child/ren in?

Grade 1-3	
Grade 4-7	

Do you have access to technology at home?

Yes	
No	

Appendix G: Questionnaire

Perceptions Questionnaire:

What is your definition of technology in the classroom?

How often do you use technology in the workplace? (Please tick)

Daily	
Weekly	
Now and again	
Not often	
Never	

Attitudes: Please rate on a scale of 1 – 5 where 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree), your level of agreement with the following statements (tick):

	1	2	3	4	5
1. Technology makes tasks more convenient.					
2. The increase of technology use will result in no basic skill activities (eg: writing)					
3. Technology can be harmful.					
4. Technology is a useful tool.					
5. Technology improves quality of life					
6. Technology should not be encouraged					
7. Technology promotes social behaviour.					

8. Technology is beneficial in producing knowledge					
9. Technology can be beneficial to the country					
10. Technology should be promoted in all sectors					

Some items adapted from Workman (2014): Unified Theory of Acceptance and Use of Technology Acceptance Measure

11. What is your overall perception of technology in your day-to-day life?

Usage & Technology Competency:

Please rate on a scale of 1 – 5 where 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree), your level of agreement with the following statements (tick):

	1	2	3	4	5
1. I know how to do basic level skills with technology.					
2. I want to learn how to use technology more effieciently.					
3. I do not need help in my ability to perform tasks on a day-to-day basis					
4. I use technology in my free time.					
5. Technology is difficult to use.					
6. I do not know how to use technology and do not want to learn.					
7. Technology use is important.					
8. I have advanced technology skills.					
9. It was easy for me to learn how to use					

technology					
10. I am highly competent in technology use					

Adapted from Hwang et al. (2014): Technology Acceptance Questionnaire

Technology and children:

Please answer the following questions:

1. At what age was your child exposed to technology at home?

2. At what age was your child exposed to technology in the classroom?

3. What are your reservations about technology use in the classroom?

4. What do you think the benefits are of technology use in the classroom?

5. Have you heard about the *Smart Schools Project* as introduced on January 2015? If so, what do you know about it?

6. At what age do you think children should be exposed to technology in the home?

7. At what age do you think children should be exposed to technology in the classroom?

8. What is your overall perception of technology in the classroom?

Please rate on a scale of 1 – 5 where 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree), your level of agreement with the following statements (tick):

	1	2	3	4	5
9. Technology can improve learning in the classroom.					
10. Technology skills are important for students to learn					
11. Students should be encouraged to learn about technology					
12. Technology will give students skills they will need one day in the workplace					
13. Technology is a good way in which education can be standardised across South Africa					

Appendix H: Supervisor Contract

16. STATEMENT OF PRINCIPLES FOR POSTGRADUATE SUPERVISION

IN A CONTEXT OF ACADEMIC FREEDOM AND WITHIN A FRAMEWORK OF INDIVIDUAL AUTONOMY AND THE PURSUIT OF KNOWLEDGE THIS AGREEMENT IS WRITTEN IN THE BELIEF THAT THERE IS A RECIPROCAL RELATIONSHIP AND MUTUAL ACCOUNTABILITY BETWEEN SUPERVISOR AND STUDENT.

SUPERVISOR AND THE STUDENT:

will establish agreed roles and clear processes to be maintained by both parties. In the case of joint supervision everyone's role needs to be clarified. will meet regularly and as frequently as is reasonable to ensure steady progress towards the completion of the proposal, research report, or dissertation or thesis. This time varies but the normal minimum requirement for face-to-face contact, spread across each year of registration is: 10 contact hours for an Honours project, 15 contact hours for a Masters by research report and 24 contact hours for a Masters by dissertation and a PhD. will keep appointments, be punctual and respond timeously to messages. will keep one another informed of any planned vacations or absences as well as changes in his or her personal circumstances that might impact on the work schedule. Planned absences or delays should be discussed as soon as possible and arrangements should be made to catch up lost time. will ensure that research on animal or human subjects is conducted according to the procedures and the requirements of the relevant University Ethics committee. will together complete progress reports on the research project, as requested by each Faculty Graduate Studies Committee.

THE SUPERVISOR:	THE STUDENT:	I confirm that I have read and understood this statement and agree to be guided by its principles
undertakes to provide guidance for the student's research project in relation to the design and scope of the project, the relevant literature and information sources, research methods and techniques and methods of data analysis. is a responsibility to be accessible to the student. will be prepared for meetings with the student. includes being up-to-date on the latest work in his/her area of expertise. expect written work as jointly agreed, and will return that work with constructive criticism within a timeframe (a suggestion of 2-4 weeks) jointly agreed at the outset of the research. will provide advice that can help the student to improve his/her writing. is may include referrals for language training and academic writing. The supervisor will provide guidance on technical aspects of writing such as referencing as well as on discipline specific requirements. Detailed correction drafts and instruction in aspects of language and style are not the responsibility of the supervisor. will support the student in the production of a research report, dissertation or thesis. Provision should be allowed for adequate, mutually respectful, discussion around recommendations made. will assist with the construction of a written time schedule which outlines the expected completion dates of successive stages of the work. will ensure the student has the opportunity to present work at postgraduate seminars/national/international conferences as appropriate. will assist with the publication of research articles as appropriate. will discuss the ownership of research conducted by the student in accordance with the University guidelines and rules on intellectual property, co-authorship and copyright. will ensure that the research is conducted in accordance with the University's policy on plagiarism. will ensure that the student is made aware in writing of the inadequacy of progress and/or of any work where the standard is below par. Acceptability will be according to criteria previously supplied to the student.	1. Undertakes to work independently under the guidance of the supervisor. This includes reading widely to ensure that the literature pertinent to his/her chosen topic has been identified and consulted. 2. Is obliged to make appointments to see the supervisor and will arrange meeting times well in advance. 3. Will think carefully about how to derive maximum benefit from these contact sessions by planning what he/she wants in these sessions. 4. Should submit written work for discussion with the supervisor well in advance of a scheduled meeting. The kind and frequency of written work should be agreed with the supervisor at the outset of the research. 5. Undertakes to submit written work that is relatively free of basic spelling mistakes, incorrect punctuation and grammatical errors. Responsibility for the accuracy of language, the overall structure and coherence of the final research report, dissertation or thesis rests with the student. 6. Undertakes to heed the advice given by the supervisor and to engage in discussion around suggestions made. Ultimately the student has to take responsibility for the quality and presentation of the work. 7. Should strive, within reasonable bounds, to maintain a focus on his/her research area and to work within the agreed time schedule. 8. Will prepare material for presentations at seminars and conferences. 9. Undertakes to submit papers for publication. 10. Agrees to honour agreements about ownership of the research and in accordance with the University's guidelines and rules in relation to co-authorship, copyright and intellectual property. 11. Will ensure that the work contains no instances of plagiarism and that all citations are properly referenced and that the list of references is accurate, complete and consistent. 12. Agrees to work in accordance with the criteria of acceptability as supplied by the supervisor. 13. Undertakes not to place the supervisor under undue pressure to submit work for examination until the supervisor is satisfied that it has reached an acceptable	Name of student: <u>Lauren Shunmugam</u> Student's signature: <u>[Signature]</u> Name of Supervisor: <u>Adn Vorster</u> Supervisor's signature: <u>[Signature]</u> Name of Co-Supervisor: <u>NA</u> Co-Supervisor's signature: <u>NA</u> The broad area of study is: <u>Parents' Perceptions of the use of technology in primary school classrooms</u> Provisional submission date is: <u>November 2015</u> Degree: <u>MA Social & Psychological Research</u> School: <u>Human & Community Development</u> Faculty: <u>Humanities</u> Date: <u>2/02/2015</u>