MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS

by

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DECLARATION

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Managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools

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I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

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SUMMARY

This study sought to investigate managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. I found myself frequently asking whether educators and learners do suffer from nomophobia (the irrational fear of not having access to their mobile phones and the capabilities on their mobile phones), and how the usage of mobile phones impacts on the quality of teaching and learning. Furthermore, I felt it necessary to develop a framework and make recommendations regarding future use of mobile phones in the classroom.

In this study, I chose a mixed methods single case research (MMSCR), where an explanatory sequential research design was adopted. In the quantitative phase (Phase 1) data was collected using a questionnaire and in the qualitative phase (Phase 2) data was collected using open-ended questions in face-to-face semi-structured interviews.

The primary quantitative data from Phase 1 of the research revealed that respondents displayed mild, moderate and severe nomophobia. No respondents displayed a complete absence of nomophobia. The quantitative phase (Phase 1) further revealed that educators displayed higher levels of nomophobia as compared to learners.

The qualitative phase (Phase 2) indicated that educators use their mobile phones for work related information. Mobile phones allow them to stay in touch with people from work, their families and friends. Educators do feel uncomfortable without access to the information that they regularly check up on and by their own admission do spend a lot of time on their mobile phones. Unlike educators, learners have an affinity for games and admitted being addicted to the games. Furthermore, learners did use their mobile phones to access resources for schoolwork, and to keep in touch with family and friends.

Respondents' recommendations mirrored the literature and if these are addressed, it would create an excellent framework for managing the use of mobile phones in the

classroom. To address the impact of nomophobia on the quality of teaching and learning in Gauteng schools, one needs optimum levels of commitment and performance from educators and learners. It is with this in mind that the study was conducted.

KEY TERMS:

Mobile phones, cell phones, educators, learners, secondary schools, quality of teaching and learning, M-Learning, Network Society, discipline, addictions.

DEDICATION

I dedicate this dissertation to my grandson Hamzah Matwadia.

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CHAPTER ONE
ORIENTATION TO THE STUDY

1.1 INTRODUCTION AND BACKGROUND

In 1973, the first call from a hand-held device was made with a phone shaped like a brick that weighed about 2,4 pounds. Martin Cooper, an executive at Motorola, picked up the large device, one that only worked for 30 minutes of chatting after a 10-hour charge and called Dr Joel Engel, an engineer at their rival company, Bell Labs (Dyroff, 2018). The cell or mobile phone has since evolved to connect humans in ways that our ancestors could never have imagined.

Mobile phones have become a necessity for many people throughout the world. The ability to keep in touch with family, business associates, and access to email are only a few of the reasons for the increasing importance of mobile phones. Today's technically advanced mobile phones, referred to as smartphones, which have the functionality of computers (or mini-PCs), are capable of not only receiving and placing phone calls, but storing data, taking pictures, and can even be used as walkie talkies, to name just a few of the available options (Kingston, 2020).

Not surprisingly, people find that they just cannot do without their mobile phones. Nomophobia is the irrational fear of being without your mobile phone or being unable to use your phone for some reason, such as the absence of a signal or running out of minutes or battery power (Rouse, 2013). A phobia is by definition an irrational fear (Webster, 2019). In the case of nomophobia, the events that the user fears are not terribly unlikely, so that part of it isn't irrational; what is irrational is the degree of discomfort the users feel at the thought of being separated from their smartphones.

Mobile learning is a new learning paradigm that exploits the use of mobile devices in education (Furio Ferri et al., 2015). Mobile learning or M-learning is any type of content that is developed or consumed on mobile devices, such as mobile phones or tablets, and including anything from podcasts to full eLearning courses. Laskaris (2018) expands on the benefits of mobile learning. He is of the opinion that mobile learning offers learners flexibility to learn at their own pace; better completion rates and higher

retention; allows for collaborative learning; higher engagement; multi-device support; performance support and a learning path.

In the school environment, nomophobia is a fear that grips both learners and teachers alike. Coker (2014) says that nomophobia is real and it hampers workplace productivity. The unnecessary use of mobile phones in schools by learners has a negative effect on learning, and on the flip side of the coin, the unnecessary use of mobile phones by teachers has a negative effect on teaching (Davie & Hilber, 2017).

Since the dawn of human civilization, man has been creating things to meet his needs. The mobile phone is one such, portable electronic device. They are now inexpensive, easy to use, comfortable, and equipped with almost every latest feature such as a calculator, internet games, camera, and many other features. They are also known as lifesavers as they can help people in emergencies (Mendoza, Benjamin, Lee & Mc Donough, 2018). A coin has two faces. Likewise, a mobile phone has its own demerits. It has severe health implications. Symptoms can range from headaches, earaches and blurring of vision by the radiation (Chui, 2014). Moreover, psychiatrists believe that mobile phone addiction is becoming one of the biggest behavioural addictions (Davie & Hilber, 2017). Teenagers are engaged on their mobile phones all the time, whether it be on phone calls, using SMS text messages, or personalizing the mobile phones with ringtones and pictures (Bivin, Mathew, Thulasi & Philip; 2013). Kim's (2013) study in South Korea found that mobile phone addiction has genuine consequences which affected student success. Sufferers were unable to do schoolwork, found that interpersonal relationships suffered and felt anxiety and loneliness without their mobile phones. Emmanuel (2015) found that the negative consequences of mobile phone addiction leads to a lack of sleep, loss of energy, unhealthy lifestyle and a drop in academic performance.

Davie and Hilber (2017, p 100) succinctly put it, "*New technologies have brought new forms of addiction with them.*" Traditional addictions to alcohol, drugs or gambling have now been joined by addictions to videogames, the internet and even mobile phones. Mobile phone addiction, commonly termed nomophobia (Wikipedia, 2016; Petter, 2018; Webster, 2019) is one of the newest forms of digital addiction and as such has been

less researched than other forms, such as internet addiction, for example. However, researchers in South Korea (Kim, 2013; Kwon, 2013; Jena, 2015) have found that levels of mobile phone addiction are even higher than internet addiction. One of the causes posited for this was the convenience of mobile devices. One of the same factors which makes mobile learning so interesting and useful may therefore also be leading to a dangerous addiction. Educational institutions which have actively encouraged learners to make use of mobile devices should be prudent to investigate this topic before further expanding the use of mobile learning.

In July of 2018, the French government passed a law banning mobile phones in schools. The law passed 62 votes to one. The policy came into effect during the beginning of the 2018-2019 school year and impacts learners in kindergarten through the 9th grade (Hess, 2019). Beland and Murphy (2015) traced the impact of banning mobile phones at schools on exam scores. They found that learners in schools with phone bans earned higher test scores and that low-performing learners benefited the most. Beland and Murphy (2015, p18) conclude their study that, "*Restricting mobile phone use can be a low-cost policy to reduce educational inequalities*."

Gautam (2018) elaborates on the learning opportunities created by mobile phone technology: Anytime and anywhere learning; digital first thinking; dynamic teaching methodologies and personalisation of learning. Adeboye (2016) further expands on the effective uses of mobile technology in the classroom. He says that mobile phones create time efficiency and effectiveness.

It is evident that new technologies create opportunities as well as challenges for teachers and learners. The use of the mobile phone in the classroom, has been the subject of educational and media scrutiny. Research shows that mobile phones serve as distractions in the classroom setting and impair learning (Mendoza et al., 2018). The research on teacher nomophobia is scarce. However, Moreno-Guerrero, Lopez-Belmonte, Romero-Rodriguez and Rodriguez-Garcia (2020) have conducted research on the impact of cell phone use on pre-service teachers, and their findings highlight that it is necessary to make educational interventions with regard to mobile phone usage and to promote education for the responsible and critical use of media and

technologies. Thus, teaching and learning can be severely compromised if learners and teachers alike have mobile phone addictions or nomophobia.

1.2 RATIONALE FOR THE STUDY

At the school at which I teach, mobile phones are banned. Learners who have mobile phones have to hand it in at the office in the morning or face having the mobile phone confiscated if they are found with it. Despite the ban, many learners have mobile phones with them. On one occasion when a mobile phone was removed from a learner, the learner became aggressive with the educator. Learners will do anything to have their mobile phones with them at all times. I have also seen educators who have their mobile phones in their hands all the time, and display feelings of anxiety when their mobile phones get lost or are stolen.

The rationale for this study was threefold. Firstly, this study determined whether learners suffer from nomophobia and if indeed it had an impact on learning. Secondly, researchers assume that learning is impacted by learner nomophobia (Jena, 2015; Yildiram & Correia, 2015; Mendoza, et al., 2018). Research conducted on the impact of teacher nomophobia on the quality of teaching is a scarcely researched topic. The implications and effects of teacher nomophobia have yet to be considered. The research that will be undertaken will address this question scientifically in order to make reliable and valid conclusions that go beyond assumptions. Thirdly, related research has indicated barriers and challenges to the use of mobile phones in the classroom (Lee, Kim, McDonough & Mendoza, 2017). The research will address these barriers and make recommendations regarding future use of mobile phones in the classroom.

It is important to conduct a contextual study that explores the impact of learner and teacher nomophobia on the quality of teaching and learning. The research from other contexts can only provide general frameworks regarding the constructs involved. It cannot replace the research conducted specifically for learners and teachers that suffer from nomophobia, and the impact of their nomophobia on the quality of teaching and learning in Gauteng schools.

1.3 THEORETICAL FRAMEWORK FOR THE STUDY

Van Dijk (2006) has defined the idea of a 'Network Society' as a form of society that is increasingly organizing its relationships in media networks, gradually replacing or complementing the social networks of face-to-face communication. Personal and social-network communication is supported by digital technology. Van Dijk also warns that these abstract, yet barely visible reality, is making humans dependant on computer networks such as the internet.

The theoretical framework underpinning the study is the Network Society Theory which emphasises the significant role played by the new technologies of information and communication and the formation of connections for the creation and distribution of knowledge in the Network Society. Castells (2004) and Anderson (2014) maintain that participants in the Network Society use communication, computer networks and the internet to create and acquire, share and disseminate information in order to become knowledgeable and better human beings and to make the world they live in a better place.

The use of mobile phones in the Network Society is also important to induce the culture of virtual reality which stimulates creative thinking by allowing problem solution in ways not usually possible (Castells, 2011). In a pedagogical situation, virtual reality technologies are used in authentic learning where learners experience phenomena that are impossible to explore in the traditional classroom. This theoretical framework requires teachers to use mobile phones in their teaching tasks in order to produce learners equipped with 21st century skills that will be required for future jobs and for the economic growth of the country.

The researcher chose the Network Society Theory on the basis that today's teachers and learners are part of the Network Society which is using mobile phones in all spheres of life. Secondly, South Africa has a shortage of adequately trained teachers in urban and rural schools. Therefore, mobile phones, in the researcher's view, can be seen as a solution for the professional development of teachers and to equip them with the knowledge they require to be able to teach their learners. However, the addiction of teachers and learners to their respective mobile phones can prove to be a challenge to

the quality of teaching and learning. This study purports to present some empirical data on the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

1.4 PRELIMINARY LITERATURE REVIEW

Mobile phones have very important roles in several sectors, which have seen major changes resulting from the use of mobile phones by staff that use them to complete their tasks and communicate with a remote workplace while working from home. The boundary between one's professional and personal life has begun to gradually disappear day after day. It is now seen that employees perform their duties in the evening from their homes or during holidays and vacations. Thus, owning a mobile phone gives employees the ability to communicate with their place of work and perform their duties any time and any place. Employees can communicate with each other and do their work all the time. If managers give their employees some flexibility in working hours, this is a positive thing (AlZwamri & Hussain, 2017).

Many researchers have reported positive impacts of using mobile phones at the workplace. Mobile phones can benefit a workplace by promoting autonomy; instilling strong employee/organization relationships from bottom to top and encouraging knowledge sharing (Gagni & Deci, 2005; Pitichat, 2013). Employees feel relaxed and comfortable while using their personal mobile phones, and this personal and stress-free factor leads towards work efficiency. Kakihara and Sorensen (2002) also confirmed that the mobile phone has gained its popularity as a communication platform in the workplace because it provides an improved function to help workers organize their assignments and allows people to work anywhere anytime.

Khalife (2017) elaborates on the damaging effects of excessive mobile phone use at work. Khalife (2017) points out that addiction to the mobile phone is becoming a significant mental health problem. A condition known as nomophobia (no-mobile-phobia) has been defined as the ‘discomfort or anxiety caused by the non-availability of a mobile phone, PC or any another virtual communication device. It is a very real problem for a growing number of people and an underestimated problem for employers

keen to minimise disruption to the working environment or reduce pressure on healthcare costs.

Lin and Li (2019) found in their study in China that new messaging services such as Snapchat and WhatsApp increase mobile phone activity further still, distracting workers from meeting performance objectives, lowering productivity, and increasing both physical and emotional distress arising from mobile phone obsession. Lin and Li uncovered that mobile phone dependency can enhance workers job performance, however, once the dependency turned to addiction, job performance diminishes.

The above scenarios show the effects of mobile phone usage in the general workplace. In the school environment, the use of mobile phones can positively and negatively affect both teaching and learning. Research continually shows how distracting mobile phones are and it is in light of this fact that in July 2018, the French government passed a law banning mobile phones in schools (Hess, 2019).

While the mobility of smartphones provides apparent benefits and enable individuals to satisfy their basic needs (Kang & Jung, 2014), it may also induce some problems associated with smartphone use. Previous studies have shown that smartphones may cause compulsive checking habits (Oulasvirta et al., 2012), that smartphones may lead to compulsive usage and increased distress (Matusik & Mickel, 2011), and that smartphones can be addictive (Chiu, 2014; Lee et al., 2014). Another problem exacerbated by smartphones is nomophobia. Nomophobia, or no mobile phone phobia, is ‘‘*the fear of being out of mobile phone contact’’* (Rouse, 2013, p 1).

The benefits of mobile learning in schools have been illuminated by Steel (2012) and Keengwe and Bhargava (2014). The challenges of allowing mobile phones in schools have been expounded by Kumar (2011) and Synnott (2018). The benefits and challenges of mobile learning will be discussed in detail in Chapter Two.

Elliot Soloway is a proponent of mobile phone use in the classroom (Soloway, 2009). Soloway is convinced that there is a huge shift toward interactive learning using mobile phone technology tools that will change the paradigm of teaching from one based on memorization to one based on information access, project orientation, and subject

matter integration. Modern mobile phones have evolved into true mobile computing platforms, and learners already have them and bring them to school. Interest in the use of mobile phones to provide cost-effective, integrated, hands-on learning that improves recall and builds sophisticated problem solving is high.

Classroom mobile phone use can not only help increase student interest and engagement but can also provide teachers with a streamlined approach to the integration of in class academic research and citation, active learning methodologies, and cooperative learning strategies (Wilson & Piraino, 2015). Mobile phones are motivational strategies for engagement with language; increased connections to content; knowledge and comprehension building; and content specific areas.

Anita Charles (2012) says that enforcing mobile phone bans is simply impossible. She says that understanding rules for mobile phones leads to important understandings of teacher-student negotiations. Although schools and teachers set rules that define appropriate behaviours with social digital networks, it also appears that learners and teachers frequently negotiate the boundaries through relationships founded on trust and respect.

1.5 STATEMENT OF THE PROBLEM

The Gauteng Department of Education (GDE, 2011) and the South African Schools Act (DoE, 1996) has issued guidelines for a mobile phone policy for learners. The guidelines allow learners to bring mobile phones to school and do not place a ban on the use of mobile phones at school. The guidelines acknowledge that mobile phones can cause distractions, cyber-bullying, theft and cheating. There is no mobile phone policy for teachers from the GDE, however, individual schools do have their own policies (Anon, 2014).

The popularity of mobile phones among learners and teachers alike is ascribable to the affordances they provide. Mobile phones make it possible to perform a variety of daily tasks in one device, including but not limited to, calling and texting people, checking and sending email messages, scheduling appointments, surfing the internet, shopping, social networking, searching for information on the internet, gaming, entertainment, etc.

(Yildiram & Correira, 2015). Because mobile phones are ubiquitous and provide numerous capabilities, Kang and Jung (2014) propose that mobile phones go beyond serving communication, information and entertainment purposes. They state that mobile phones enable people to *"fulfill needs such as learning, individual capability, safety, and human relationships"* (Kang & Jung, 2014, p. 377), which is attributed to the mobility of mobile phones.

Thus, people have become dependent on their mobile phones more than ever, which, in turn, supposedly exacerbates the feelings of being out of mobile phone contact. Although there has been increasing academic interest in investigating the problems emanating from mobile phone use, research into the impact of nomophobia on teaching and learning in Gauteng has been scarce. It was important to conduct a contextual study that explored the impact of nomophobia on teaching and learning in The Gauteng Department of Education. The research from other contexts can only provide general frameworks regarding the constructs involved. The present study discussed a framework for managing the impact of nomophobia on teaching and learning in Gauteng Schools.

1.6 RESEARCH QUESTION AND HYPOTHESES

The situation described above raised the main research question for the study, namely: **How can the impact of nomophobia on the quality of teaching and learning in Gauteng schools be managed?** To help provide an answer to the question, the following secondary research questions or sub-questions were developed:

- What is nomophobia and how can it be overcome?
- Do teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and to what extent?
- In which manner or way does nomophobia affect the quality of teaching and learning in Gauteng classrooms?
- How can the negative impact of nomophobia on teaching and learning in Gauteng classrooms be managed effectively?

1.7 PURPOSE, AIMS AND OBJECTIVES OF THE STUDY

The main purpose or aim of this study was to determine how the impact or effect of nomophobia, encountered by teachers and learners in Gauteng schools, could be managed effectively. The sub-aims or objectives of the study were to:

- Define and describe the concept of nomophobia.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the impact or extent of nomophobia on teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

1.8 RESEARCH METHODOLOGY

1.8.1 The research design

According to Salkind (2018), the research design is the method and structure of an investigation selected by the researcher to conduct data collection and analysis. It is also the plan of action or blueprint to be followed to enable the researcher to give answers to the research question (McMillan & Schumacher, 2014). Bryman and Bell (2015) underscore that a choice of research design reflects decisions about the priority being given to a range of dimensions of the research process. The causality and generalisations in the research process were influenced by the kind of research question that was posed. The researcher agrees with the view advanced by Creswell (2014) since the research design for this mixed methods research study provided specific direction for procedures used in this research study. Gray (2014) highlights that, in a mixed methods research study, quantitative and qualitative data are collected sequentially and involve the integration of data at one or more stages in the process of the research. These approaches are complementary since, as McMillan and Schumacher (2014) aver, qualitative findings usually inform and support the quantitative results.

For this mixed methods research study, the explanatory sequential research design was used. This research design in this study involved two distinguishable phases:

- **Phase 1**: The researcher collected quantitative data and analysed them (Creswell, 2014). Thus, the first phase helped in determining the selection of appropriate questions in Phase 2.
- **Phase 2**: The results of Phase 1 were then built on by employing a qualitative approach (Creswell, 2014).

Why was the explanatory, sequential research design chosen for this study? In short, the explanatory, sequential research design ably assisted the researcher to use the qualitative data in elucidating matters in finer detail to add meaning to the quantitative results (Creswell, 2014). The net effect allowed for an in-depth understanding of the sub-questions posed in this study. This detailed understanding lead to the management of the impact of nomophobia among learners and teachers on the quality of teaching and learning in Gauteng schools.

1.8.2 Research approach and paradigm

A mixed methods approach involving both quantitative and qualitative methods was adopted for the study. Thus, some disadvantages associated with quantitative approaches like insensitivity to emotions, feelings, insights, motives, intents, views and opinions of the subjects studied were catered for by the qualitative research aspect of this study (McMillan & Schumacher, 2014). With the qualitative approach, respondents have the opportunity to respond in their own words, rather than being forced to choose from fixed responses, as the quantitative method demands. Also, with a quantitative approach, researcher bias and a limitation of the qualitative approach is eliminated (Creswell, 2014; McMillan & Schumacher, 2014).

Mixed methods research is a good design to use since it builds on the strengths of both quantitative and qualitative data (Creswell, 2014). This study adopted the mixed methods explanatory sequential design (McMillan & Schumacher, 2014). In this design, the quantitative data were collected first and, depending on the results, qualitative data were collected second to elucidate, elaborate on, or explain the quantitative findings. A

large sample of teachers and learners were surveyed to determine their personal perceptions on nomophobia and its impact on teaching and learning. In the second phase, fewer teachers and learners were selected using a qualitative approach to determine their perceptions on how nomophobia can be managed in Gauteng classrooms. A questionnaire with closed questions was used for the quantitative phase and semi-structured interviews with open ended questions was used in the qualitative phase to determine the impact of nomophobia on teaching and learning by both teachers and learners in Gauteng schools.

A mixed methods case study research design, which combines quantitative and qualitative methods, and provides in-depth analysis for a case was used for this study (Creswell, 2015; Cook & Kamalodeen, 2019). The use of both approaches together did provide a more complete investigation. With a mixed methods approach, researchers are not limited to using techniques associated with traditional designs. An important advantage of mixed methods studies is that they can show the result (quantitative) and explain why it was obtained (qualitative) (McMillan & Schumacher, 2014).

As noted above, this design will involve two separate phases. Firstly, in Phase 1, the researcher collected information and data using questionnaires. Then, Phase 2 entailed using semi-structured interviews to explain and clarify the results of Phase 1 (Creswell, 2014). Regarding Phase 2, since the researcher propounds open-ended questions to the participants in order to gain insight into their beliefs, ideas, opinions and views, McMillan and Schumacher (2014) remonstrate that interviews are the most significant tool for data collection in the qualitative research approach. Moreover, using the two approaches (shown as Phase 1 and Phase 2 above) assisted the researcher with an in-depth exploration of the topic thus contributing to the poly-dimensional outlay of this study.

According to Creswell (2014), the mixed-method research methodology involves the combination of quantitative and qualitative data. By using the mixed-methods research methodology in this study, the researcher believes and agrees with the view advanced by Teddlie and Tashakkori (2009) that any one viewpoint or methodology (quantitative or qualitative) does not hold the authoritative key to truthfully answering the research

questions. The researcher's decision for this choice of research methodology was further buttressed by Mertens (2010) who emphasised the view of Teddlie and Tashakkori (2009), that mixed-methods research has particular value when a researcher is trying to solve a problem that is present in a complex schooling or social context. Further information relating to the explanatory, sequential research design that has been chosen for this study will be elaborated on in Chapter 4 of this thesis.

Creswell (2014) states that because all researchers have hidden ideas or philosophical assumptions that influence the approach they take to their studies, researchers should clearly identify these basic beliefs or worldviews. Their philosophical stance determines the direction in which the research flows and ensures that the specific methods are congruent with the approach. While supporting the importance of establishing one's worldview, other researchers have employed the term paradigm (Mertens, 2010; Lincoln et al., 2011; Hussein, 2015). For the purposes of this study, this researcher also uses the term, paradigm.

Johnson and Christensen (2019) describe a paradigm as the framework of beliefs and assumptions through which a researcher understands and relates to the world. This description strengthens their earlier claim that, a researcher's paradigm is expressed in his ontology (his views of the nature of reality), his epistemology (his view about how knowledge is increased), axiology (his views on the roles that values play), methodology (his views on research methods) and rhetoric (his views on the best language to use) (Johnson & Christensen, 2019).

Grix (2002:177) as in Daniel and Harland (2018) considers ontology as *"the starting point of all research".* Ontology is concerned with how reality is perceived by respondents (Daniel & Harland, 2018). The ontological nature of the research was important because it influenced the researcher's knowledge of the reality of the perceptions of nomophobia among teachers and learners and the impact it has on the quality of teaching and learning in Gauteng classrooms. To gain these perspectives, the researcher used a mixed methods approach and made use of closed ended questionnaires (quantitative) and semi-structured interviews with open-ended questions (qualitative data). Epistemology, on the other hand, is concerned with what

we know about reality and how we can know it (Willis, 2007; Daniel & Harland, 2018). It looks at the foundation of knowledge, its nature and forms, its acquisition and its communication to others (Cohen, Manion & Morrison, 2007; Daniel & Harland, 2018).

The focus of the study was to investigate the effect that learner and teacher nomophobia has on the quality of teaching and learning in Gauteng classrooms. For this, the Pragmatic paradigm was adopted (Kivunja & Kuyini, 2017). What was needed was a worldview which would provide methods of research that are seen to be most appropriate for studying the phenomenon at hand. This approach allowed a combination of methods that in conjunction could shed light on the actual behaviour of participants, the beliefs that stand behind those behaviours and the consequences that are likely to follow from different behaviours (Martens, 2015; Kivunja & Kuyini, 2017). This paradigm advocates a relational epistemology (i.e. relationships in research are best determined by what the researcher deems appropriate to that particular study), a non-singular reality ontology (that there is no single reality and all individuals have their own and unique interpretations of reality), a mixed methods methodology (a combination of quantitative and qualitative research methods), and a value-laden axiology (conducting research that benefits people) (Kivunja & Kuyini, 2017). The pragmatic paradigm is normally associated with the mixed methods research approach (Creswell, 2014).

Reality is socially constructed and therefore multiple mental constructions can be apprehended, some of which may conflict with one another. Furthermore, perceptions of reality may change as concepts of nomophobia and the quality of teaching and learning are socially constructed phenomena that mean different things to different people (Mertens, 2010; Daniel & Harland, 2018).

In Chapter 4 of this thesis, a discursive exposition will be presented in connection with the research paradigm relating to this study.

1.8.3 Population and sampling

1.8.3.1 Study population

McMillian & Schumacher (2014) define the population of a research study as a large group of individuals from which a researcher infers conclusions. A case study of a school that bans the use of mobile phones for learners will be researched. Based on the theme of the study, the population for the study includes all the teachers and learners in the case. The Gauteng public school that was part of the case had 1020 learners and 42 educators. Since the population of this study is large, sampling is required for each phase of the study.

The research explored whether teachers suffer from nomophobia and how this affects the quality of teaching. Furthermore, the research also explored whether learners suffer from nomophobia and how this affects the quality of learning. The research concludes with recommendations on managing the impact of nomophobia on teaching and learning.

1.8.3.2 Sample and sampling procedures for Phase 1: The quantitative phase

This study applies purposeful sampling for the selection of the case (a Gauteng public secondary school), a census approach for the for the quantitative phase (Phase 1) of the study and convenience sampling for the qualitative phase (Phase 2). The school that was used for the case had a population of 42 educators and 1020 learners. The entire school population was surveyed. A total of 620 valid questionnaires were received and analysed.

Data was analysed using the Statistical Package for Social Science (IBM SPSS Version 27) software. IBM SPSS was used in computing descriptive statistics and multivariate analysis. This process includes univariate analysis, cluster analysis and variance analysis which was used to perform an exploratory factor analysis for the respondents. Validity, reliability, trustworthiness, and ethical procedures was duly ensured via the approved procedures. These will be discussed at length in Chapter 4.

Permission was received from the Gauteng Department of Education as well as from the Ethical Clearance Committee of the University of South Africa. Phase 1 consisted of questionnaires that were given to all the teachers *($n_{1 = 42}$)* and to all the learners *($n_{2 = 1020}$)* at the selected school. For this quantitative phase (Phase 1), response rates were very important for analysis.

Because the mixed methods research approach was used for this study, a census approach of sampling was used for Phase 1. This means that, for Phase 1, the study population was defined by learners and teachers at a Gauteng public school that has a ban on the use of cell phones and that has been selected for the case study.

In Phase 1 of this study, purposeful sampling was applied in the selection process of the Gauteng school (the case) that was used for the study. Further details relating to the population, sample and sampling techniques used in Phase 1 will be provided in Chapter 4 of this thesis.

1.8.3.3 Sample and sampling procedures for Phase 2: The qualitative phase

This study potentially conducted a survey of teachers and learners at a single school (the case) in Gauteng. This study had two samples, the teachers at the school and the learners at the school.

The sample of teachers were made up of all levels of teachers, with different skills, and differing years of experience. The teachers were male and female participants who speak different languages, were from a different ethnicity and different geographical locations. The learners were from grade 8 to grade 12. The teacher and learner population encompassed learners and teachers from mixed socio-economic status, race and gender. The emphasis of the research was on representativeness as well as in selecting cases that were information rich.

For Phase 2, a total of twenty-one participants (n=21) were interviewed. The participants for the qualitative phase of the study were made up of 15 learners (3 learners from each grade starting from grade 8 to grade 12) and 6 teachers that were part of the case study. The researcher planned to undertake convenience non-

probability sampling to select learners and teachers at Gauteng schools that have a ban on the use of cell phones at school. Convenience sampling has the benefit of it being less costly and time consuming, has an ease of administration, usually assures a high participation rate and it is possible to generalise similar subjects (McMillan & Schumacher, 2014).

A more comprehensive outlay of the population, sample and sampling procedure used in Phase 2 of this study will be presented in Chapter 4.

1.8.4 Instrumentation and data collection techniques

A descriptive case study design was used as the purpose was to describe a phenomenon in its real-world context (Yin, 2014). Three questionnaires were used. One questionnaire was structured for educators and learners, and it collected quantitative data (Phase 1). The second questionnaire consisted of a semi- structured interview which was used to collect qualitative data from educators (Phase 2). The third questionnaire was a semi-structured interview schedule used to collect qualitative data from learners (Phase 2). These were analysed.

1.8.4.1 Data collection in Phase 1: The quantitative phase

Quantitative data was collected by adapting the Nomophobia Questionnaire (NMP-Q) (Yildirim & Correia, 2015). The NMP-Q consists of 20 items that cover four main dimensions of nomophobia: not being able to communicate, losing connectedness, not being able to access information, and giving up convenience. Each item is measured by a 7-point Likert scale, with 1 being “strongly disagree” and with 7 being “strongly agree.”

The questionnaire has closed form items which obtained demographic information and data that can be categorised easily. The closed form questions provided categories and asked the respondent to check the appropriate box. The questionnaire was exclusively designed for obtaining details and opinions about the phenomenon under study: **Managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.**

The data collection in the quantitative phase involved two stages, namely, the pilot study stage and the main study stage. Creswell (2014) indicates that a pilot study is used as a field test in establishing the content validity of the instrument and for improving formats, questions, and scales. The pilot study enabled the researcher to make any modifications, if necessary, before distributing the questionnaires to learners and teachers in a Gauteng school (the case) where the use of cell phones is banned.

The pilot study was tested on 5 teachers and 10 learners (2 per grade from grade 8 to grade 12). The sample of subjects in the pilot test had characteristics similar to those that were used in the study. The pilot test respondents were given space to write comments about individual items and the questionnaire as a whole. The researcher wanted to determine from the pilot test if items were clear or if the questionnaire was too long (McMillan & Schumacher, 2014). After distribution, the questionnaire was then completed and used for the main study stage – which would represent the entire sample of the quantitative phase.

1.8.4.2 Data collection in Phase 2: The qualitative phase

For Phase 2, a total of twenty-one participants (n=21) were interviewed. The 21 participants for the qualitative phase of the study were made up of 15 learners (3 learners each from grade 8 to grade 12) and 6 teachers that are in Gauteng schools where the use of cell phones is banned. To find answers to the main research question and sub-questions, a total of 21 participants were selected. These participants were drawn from the selected case which is a Gauteng school where the use of cell phones is banned.

The researcher conducted one-on-one semi-structured interviews with the participants to elaborate on the quantitative data of views and thoughts regarding the management of the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The objective of the qualitative phase was to collect narrative data on strategies that will enhance the knowledge of learner and teacher nomophobia and managing the impact of this on the quality of learning and teaching. During interview sessions, an audio-tape recorder was used as this would aid the researcher in transcribing and coding data during data analysis. The researcher asked permission of the respondents

before using the recording device. Qualitative data was analysed later for occurring themes.

The researcher interviewed the respondents using open-ended questions to gain insight into their beliefs, ideas, opinions and views regarding the impact of nomophobia on the quality of learning and teaching in Gauteng schools. Phase 2 enabled the researcher to gather qualitative data to elucidate matters in finer detail and to add meaning to the quantitative results. This allowed for an in-depth understanding of the sub-questions posed in this study. This detailed understanding led to the designing of a framework for managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Informed consent was obtained from the 6 teachers taking part in the interview (qualitative) process. Dooly et al., (2017) say that in the case of research carried out with children under the age of 18 and which is in collaboration with schools, the education centre will provide parental consent for research to be carried out in the centre. Therefore, permission did not have to be sought from parents of learners who are under eighteen years of age. However, the researcher did get permission from parents to allow the learners to participate in the study. The principal of the school granted permission for the educators and learners to participate in the study. Permission was sought to make use of an audiotape during the interview sessions. The participants were made aware that their participation in this study was voluntary and that they could withdraw from the study without penalty. Information gathered from the participants was kept highly confidential. All the participants were given alpha-numeric pseudonyms to ensure anonymity, e.g., Teacher A; Teacher B and Teacher F (for educators) and Learner 01; Learner 02 and Learner 13 (for learners).

Phase 1 and Phase 2 assisted the researcher with an in-depth examination of the topic thus contributing to the poly-dimensional outlay of this study which related to managing the impact of learner and teacher nomophobia on the quality of teaching and learning in Gauteng schools. The qualitative phase of the study was important to gain a more in-depth understanding of teachers and learners' perceptions of nomophobia and its impact on the quality of teaching and learning.

1.8.5 Data analysis

Data remains meaningless unless it is analysed and interpreted (McMillan & Schumacher, 2014). For this study, the data was analysed according to Phase 1 and Phase 2.

1.8.5.1 Data analysis in Phase 1: The quantitative phase

For Phase 1 of this study, the Statistical Package for Social Sciences (SPSS) (Version 27) computer software was used to analyse the data. The closed-ended questions were assigned numbers and the statements answered were based on 7-point Likert scale. This data was captured via the SPSS computer program. Descriptive statistics and multivariate analysis were employed to interpret and present the data. Yet, it remained important to pre-process data before analysing it.

Organising data involved the explaining of inferential statistics in detail. Measures of frequency and central tendency (mean) were used to describe data obtained from the questionnaires. For the inferential statistics, data was analysed using IBM SPSS (Version 27) software. IBM SPSS was used in computing descriptive statistics and inferential statistics. Exploratory factor analysis was employed to construct a single measure for nomophobia to assess the underlying relationship between the ratings of the 28 statements in the survey. Principle component axis factoring was specified as the extraction procedure and varimax rotation method. The rotated factor matrix was presented. A two-sample t-test was performed to compare educators and learners' responses. Cronbach's alpha was calculated to determine the reliability of the items. The Pearson's correlation coefficient was used to determine the strength of the relationship between the constructs. A two-way ANOVA was used to determine how independent variables, in combination, affect a dependent variable. Acceptability, trustworthiness, and ethical procedures were duly ensured via the approved procedures. Conclusions were derived from the use of correlation and analysis of variance (ANOVA).

1.8.5.2 Data analysis in Phase 2: The qualitative phase

The researcher conducted one-on-one semi-structured interviews with 21 selected participants. These participants (made up of 15 learners and 6 educators) were called upon to elaborate on the perceptions of learners and educators regarding managing the impact of nomophobia on the quality of teaching and learning. All the participants were given alpha-numeric pseudonyms to ensure anonymity, e.g., Teacher A; Teacher B and Teacher C (for teachers) and Learner 01; Learner 05 and Learner 13 (for learners). The researcher retained an accurate, confidential list of participants' names yet, for the purposes of the study, the use of alpha-numeric pseudonyms was utilized in order to free the participants from identification and possible victimization or persecution.

During the individual interview sessions, an audio-tape recorder was used. This aided the researcher in transcribing and coding data during data analysis. The transcribed interviews were analysed using an a priori method of determining themes. The outputs (quotations and codes) and a network diagram were employed for delivering the research report.

1.8.6 Data presentation

In this study, the research design directs that data collection begins with a rigorous quantitative research phase followed by purposive sampling in the second phase which utilized the qualitative approach (Creswell, 2014).

1.8.6.1 Data presentation in Phase 1: The quantitative phase

In Phase 1 of this study, once data had been collected using questionnaires, MS-Excel and the Statistical Package for Social Sciences (SPSS) (Version 27) software was used to capture, analyse and interpret the data. Before the analysing process, the researcher would clean, code, and organize the data. For this study, data validation was used in MS-Excel to negate wrong and double entry. The researcher ensured that coding was consistent in order not to affect the validity of the analysis of results. The closed-ended questions were assigned numbers and the scaled items were recorded according to a

7-point Likert scale and were used to generate descriptive and inferential statistics. The quantitative data were presented using tables, graphs, and statistical numbers.

1.8.6.2 Data presentation in Phase 2: The qualitative phase

In the qualitative phase, the researcher conducted face-to-face semi-structured interviews. Face-to-face interviews promoted cooperation and bonding (Maree, 2019), which helped to generate more meaningful data. The researcher used the interview format to obtain data on participants' meanings, how individuals conceive their world and how they make sense of important things in their lives (McMillan & Schumacher, 2014; Maree, 2019). The participants were required to provide rich information needed for the study on open-ended questions asked in connection with managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

This phase involved organizing and preparing the data for analysis, reading through all transcripts as many times as possible for better understanding. Themes were generated according to the questions in the questionnaire. There was an overlap of responses, and these were put in the appropriate code or theme. After that, the researcher recalled the results of the quantitative phase and the findings obtained from the interviews. This was done in narrative and an exact description of the events in the transcripts were given (McMillan & Schumacher, 2014; Creswell, 2014). The qualitative data was presented using selected quotes that were poignant and/or most representative of the research findings. The setting and speakers were established in the text at the end of the quote.

The final step was the analysis of the data. From the results and findings obtained, the researcher inferred the lessons learned in managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

1.8.6.3 Triangulation of the data from the two phases

Saunders et al (2019) argue that triangulation is not just the use of different data collection techniques but also, as Flick (2018) concur, the assemblage of multiple perspectives and views from different individuals. Hence, triangulation may be viewed,

as the way of capturing a multiplicity of voices and truths to the topic, in opposition to just using the one right result. When the researcher simultaneously gathers both quantitative and qualitative data, merges them using both quantitative and qualitative data analysis, and then interprets the results together; it can provide a better understanding of the phenomenon of interest. When the results of different methods converge and support one another, researchers have triangulated the findings. This allows for a stronger overall design and more credible conclusions (McMillan & Schumacher, 2014; Creswell, 2014).

In this study, the views and perspectives from two different samples (in Phase 1 and Phase 2 respectively) were used for triangulation purposes by comparing the findings from the two samples. Once themes were identified from the data, triangulation was employed between the themes identified from the distinct data sources. In practice, this meant that the themes derived from the quantitative analysis in Phase 1 were triangulated with themes drawn from the semi-structured interviews in Phase 2 (the qualitative phase). The purpose here was to ensure consistency as well as distinctions between the themes.

The researcher believes that the choice of the explanatory, sequential research design for this study would greatly aid in achieving triangulation by employing a pluralistic approach in which, as purported by McMillan and Schumacher (2014), one method will complement and compensate for the weaknesses of the other via sequential processing.

The triangulation of the data from the two phases will be covered in-depth in Chapter 4 of this thesis.

1.9 RELIABILITY AND VALIDITY IN THE QUANTITATIVE PHASE (PHASE 1)

In quantitative studies, McMillan and Schumacher (2014) bring attention to the fact that validity is a judgement of the appropriateness of a measure for specific inferences or decisions that result from the scores generated. Validity is a situation specific concept. In order to assure others that the procedures have validity in relation to the research

problem, subjects and setting of the study, it would be incumbent to describe validity in relation to the context in which data is collected.

An inference that would be used in this study is the educators and learners' perceptions of nomophobia. This is an abstract characteristic or trait which is called a construct (Lavrakas, 2008). When inferences involve constructs, it will be important to have a clear theoretical conceptualisation about what will be measured. Subsequently, there must be a clear definition of nomophobia in relation to the study. Furthermore, the study will have to be clear about what defines a high quality of teaching and learning.

Evidence based on test content demonstrates the extent to which the sample of items or questions in the instrument is representative of some appropriate universe or domain of content or tasks (McMillan & Schumacher, 2014). The instrument that was used in this study was modified from previous instruments.

Reliability in a quantitative study is the extent to which measures are free from error (Lavrakas, 2008). We can measure error by estimating how consistently a trait is assessed (McMillan & Schumacher, 2014). The actual amount of error variance in test scores, or the reliability is determined empirically through several types of procedures. Internal consistency was achieved by using Cronbach's alpha (Cho, 2016). Cronbach's alpha determines agreement of answers on questions targeted to a specific trait. It is used when answers are made on a scale of some kind rather than as right or wrong.

1.10 CREDIBILITY AND TRUSTWORTHINESS IN THE QUALITATIVE PHASE (PHASE 2)

In qualitative studies, researcher bias occurs when the researcher selects data that fit his/her existing theory or preconceptions (McMillan & Schumacher, 2014). To establish trustworthiness, the exact texts from the participants survey were used directly during the coding process (Creswell, 2014). McMillan and Schumacher (2014) suggest that eliminating the actual influence of the researcher is impossible and the goal in a qualitative study is not to eliminate this influence but to understand it and to use it productively. The data was presented objectively and used in my personal interpretations only to interpret the findings and in the conclusion.

Trustworthiness can be demonstrated using the four criteria: credibility, transferability, dependability and confirmability (Babbie & Mouton, 2011). However, for this study trustworthiness will occur through credibility and transferability. Credibility will occur through triangulation of the open ended and closed form questions (Creswell, 2014). These methods ensured that the data is rich, thick and comprehensive and will confirm the consistency of the findings of the data. Transferability may occur if thick descriptions of data with sufficient and precise details are given within the context of Gauteng schools and the impact of nomophobia on the quality of teaching and learning.

1.11 RESEARCH ETHICS

The five basic principles of research ethics were applied in this study: minimising the risk of harm; obtaining informed consent; protecting anonymity and confidentiality; avoiding deceptive practices and providing the right to withdraw (McMillan & Schumacher, 2014).

1.11.1 Minimising the risk of harm.

Research should not harm participants (Dooly et al., 2017). Where there is the possibility that participants could be harmed or put in a position of discomfort, there must be strong justifications for this. There are several types of harm that participants can be subjected to. These include:

- Physical harm to participants.
- Psychological distress and discomfort.
- Social disadvantage.
- Harm to participants? financial status.
- An invasion of participants? privacy and anonymity.

It is important for the researcher to try to think about any adverse effects the study could possibly have on any of the participants. Of course, even though the researcher may try to anticipate any potential ethical issues, unexpected adverse effects may occur, in which case, the study should be halted or modified (Creswell, 2014).

1.11.2 Obtaining informed consent.

De Vos, Strydom, Fouché and Delport (2011) highlight that obtaining informed consent directly points to credibility of the researcher since it means that all possible or adequate information on the goal of the investigation; the expected duration of the participant's involvement; the procedures which will be followed during the investigation; the possible advantages, disadvantages and degrees to which respondents may be exposed; as well as the credibility of the researcher (De Vos et al., 2011). In this study, participants were provided with a participant information letter on the cover page of their questionnaire. In this letter, the participants' role in the study, the purpose of the study, the expected duration of participation, a guarantee of anonymity, confidentiality and privacy and a withdrawal free from penalty, were explained.

The ethical clearance certificate of UNISA as well as the researcher's personal contact details were furnished to all participants in the letter inviting them to participate in the study. Participation in the study was voluntary – no participant was coerced to participate in the study. Their individual permission was obtained to use the information gathered during the study. The privacy and rights of all the participants in the study was securely protected.

Initial informed consent was obtained by applying for ethical clearance from the University of South Africa to conduct research under guidance of the research study supervisor that was appointed by the University of South Africa. After obtaining ethical clearance to conduct the research, the researcher acquired written permission from the Gauteng Education Department to enter the selected Gauteng high school for data collection purposes. Formal letters of consent that outlined the purpose of the study was sent out to all the participants and all learners' parents. The principal of the school where the case study was done had to be contacted. The principal had to give permission in order to establish contact with the teachers and learners. Dooly et al., (2017) say that in the case of research carried out with children under the age of 18 and which is in collaboration with schools; the education centre will provide parental consent for research to be carried out in the centre. Therefore, permission did not have to be sought from parents of learners who are under eighteen years of age.

Appointments had to be made to provide a synopsis of the research project, the questionnaire involved and to deliver the questionnaires to the school. Collection dates had to be mutually agreed on.

1.11.3 Protecting anonymity and confidentiality.

Confidentiality is often viewed as a continuation of privacy (De Vos, Strydom, Fouché and Delport, 2011), which may have reference to agreements between individuals that information of someone taking part in a study may not be divulged. All participants in this study remained anonymous. Permission was sought by means of a covering letter which explained the nature of the study. Further, clarification was given regarding what would be done with the information provided by the selected participants. The participants were assured that none of the information they provided would in any way identify them to the study. The researcher ensured that no names or any information regarding the participants were made public.

1.11.4 Avoiding deceptive practices.

This study draws on the guidelines for research ethics by Oliver (2010). Oliver elaborates on the importance of honesty in research, whereby data should not be fabricated, falsified or misrepresented.

The researcher honoured patents, copyrights, and other forms of intellectual property by avoiding plagiarism. The importance of this study was to advance research and scholarship (Oliver, 2010).

1.11.5 Providing the right to withdraw.

Requests for consent will always include the possibility of opting out of the research (Dooly et al., 2017). Voluntary participation means that participants cannot be compelled, coerced, or required to participate (McMillan & Schumacher, 2014).

1.12 LIMITATIONS AND DELIMITATIONS OF THE STUDY

The limitations of the study included legal and ethical considerations (McMillan & Schumacher, 2014). This study focused primarily on teachers (the teachers included the principal of the school and members of the school management team) and learners. The researcher was ethically responsible for protecting the rights and welfare of the participants who responded to this study. The legal considerations included consent from minors' parents for the learners to participate in the study. Informed consent had to be obtained from the teachers and from the principal of the school for learners. Participants cannot be studied meaningfully by ignoring the context of real life. South Africa's social, economic and political structures continue to affect all aspects of education.

Another limitation of the study will be subject effects. Subject effects refer to changes in behaviour initiated by participants themselves in response to the research situation (McMillan & Schumacher, 2014; Flick, 2014). In this study, participants may want to increase positive or desirable behaviour, by trying to act competent and emotionally stable, which may have affected the results. Mono method bias refers to limitations based on a single way of measuring variables (McMillan & Schumacher, 2014; Creswell, 2013). There are many ways to measure nomophobia. In this study, the questionnaire was used to measure nomophobia and inferences were limited to this method. The final constraint on this study were methodological difficulties. This study measured a complex educational concept, that is, the quality of teaching and learning. The study involved formulating conceptual definitions and deciding on issues of validity.

A delimitation of the study was the selection of the participants. All teachers and learners selected for this study were from a single case, that is, a school that has placed a ban on the use of mobile phones by learners. Furthermore, the researcher decided to use grade 8 to grade 12 learners for the study. It must be noted that different educators from different schools and learners from different schools may have differing views.

1.13 CONTRIBUTION OF THE STUDY TOWARDS THEORY AND PRACTICE

Since the late 1990s, we have seen a rapid increase in the use of the mobile phone worldwide. Access to information at a persons' fingertips, literally, has seen human beings more accustomed to always having their mobile phones on their person. Moreover, this desire to have a mobile phone with people always has seen a new kind of addiction among human beings. This addiction to mobile phones is so common that it has been named nomophobia.

Teaching and learning can be severely compromised if learners and teachers alike have mobile phone addictions or nomophobia. This study focused on the extent to which teachers are addicted to their mobile phones and the impact this may have on the quality of teaching. Furthermore, this study also focused on the extent to which learners are addicted to their mobile phones and the impact this may have on the quality of learning. Finally, the research concentrated on creating a framework for managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

According to Creswell (2014), a study becomes significant if it contributes to scholarly knowledge and literature in the field and if it helps improve practice as well as policies. This study has the potential of contributing to scholarly knowledge as online library searches have revealed about 818 studies on nomophobia and the quality of teaching and learning. However, there appears to be no documented studies conducted so far on the impact of teacher nomophobia on the quality of teaching.

Other contributions of the study are delineated as follows (McMillan & Schumacher, 2014):

- The study can add to knowledge – Since, it appears that no studies have been done on the impact of nomophobia on qualified practicing teachers, this study will add to knowledge. Furthermore, all education departments locally and internationally will benefit from the study as they will gain some insight into the impact of nomophobia on the quality of teaching and learning.
- The study can help improve practice – Through this study, administrators, teachers and learners will better appreciate the impact of nomophobia on the

quality of teaching and learning. This insight may enable all education stakeholders to develop a framework for managing the impact of nomophobia on the quality of teaching and learning.

- The study can help to improve existing policy – the data generated from this study has the potential to improve existing practices and policies regarding the management of the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Such insight can enable all stakeholders in education to become more sensitive and responsive when dealing with the impact of nomophobia among learners and teachers.

The entire school community, administrators, educators and learners need to assist in creating a conducive atmosphere in which all learners can learn, and teachers can teach. This cultural responsiveness of a school involves the use of a variety of methods and programmes that will help the entire school community to adjust, accept and appreciate differences of perceptions. Based on the research findings, the school could re-examine its existing policies and services in the light of international benchmarks and adopt the most appropriate practices for its unique vision.

To conceptualize the impact of nomophobia on the quality of teaching and learning, it will become vital to understand school life, its complexities, and the interaction of its various role players. The conceptual framework will provide the substantive platform of interdependence and interrelationships relating to the present-day school system.

The focus of this study was to examine the impact of nomophobia on the quality of teaching and learning in Gauteng schools. We need to ask if other provinces in South Africa, or for that matter, if other countries around the globe are also impacted by nomophobia and how it affects the quality of teaching and learning in those educational environments? The significant impress of this study will also contribute towards developing a framework for managing the impact of nomophobia on the quality of teaching and learning.

1.14 DEFINITION OF KEY CONCEPTS

1.14.1 Nomophobia

A simple definition in Merriam Webster's online dictionary (2019) for nomophobia is 'The fear of being without access to a working mobile phone.' The Cambridge dictionary (2020) says that nomophobia is a fear or worry of being without your mobile phone or unable to use it. They elaborate with examples saying that being without mobile phone contact leads to anxiety and panic attacks in people. Furthermore, they have said that nomophobia is a rising trend among high school learners and that nomophobia has been proposed by psychiatrists as a specific phobia.

1.14.2 The quality of learning

Learning is the acquisition of knowledge or skills through study, experience, or being taught (Woolfolk, 2014). Evaluating the quality of learning is very difficult to define (Biggs & Collis, 1982). Biggs and Collis (1982) suggest that an important clue to quality is structural organisation which discriminates well-learned from poorly learned material.

This study will incorporate the major theories of learning which include behaviourist, cognitive, constructivism, experiential learning and situated learning theories as they relate to the impact of nomophobia on the quality of teaching and learning in Gauteng Department of Education.

1.14.3 The quality of teaching

Teaching is the process of attending to people's needs, experiences and feelings, and intervening so that they learn particular things, and go beyond the given (Smith, 2018). Inspectors will make a judgement on the effectiveness of teaching, learning and assessment by evaluating the extent to which teachers have consistently high expectations of what each child or learner can achieve, have a secure understanding of the age group they are working with and have relevant subject knowledge that is detailed and communicated well to children and learners. Assessment information is gathered from looking at what children and learners already know, understand and can do.

We see the role that assessment plays in reinforcing learning and helping to shape future learning. However, the question begs to be asked, why is there an emphasis on economic activity as against social, religious and political participation? Also, little account is made of the extent to which learners take responsibility for their own learning. They are encouraged to contribute to learning but not own it (Smith, 2018).

1.14.4 The Network Society

The concept of The Network Society is closely associated with interpretation of the social implications of globalisation and the role of electronic communications technologies in society. The definition of The Network Society given by the foremost theorist of the concept, Manuel Castells (2011b, p. 3) is that it is *"a society whose social structure is made up of networks powered by micro-electronics-based information and communications technologies."*

1.14.5 Addictions

Addiction is used to refer to a chronic condition where there is an unhealthily powerful motivation to engage in a particular behaviour. This can be driven by many different factors – physiological, psychological, environmental and social (West & Brown, 2013).

1.15 CHAPTER OUTLINE

The research was expounded as follows:

Chapter One is an orientation of the study, with an introduction to the topic of study, rationale, and background to the research problem: *How can the impact of nomophobia on the quality of teaching and learning in Gauteng schools be managed?*

The chapter focuses on the statement of the problem, aims of the research, research design and methodology, assumptions, limitations and delimitations, concept clarification and ethical considerations.

Chapter Two reviews relevant literature on the perceptions of learner and teacher nomophobia and its impact on the quality of teaching and learning. International and local literature centring on the impact of nomophobia in the teaching and learning environment, anxieties that result from nomophobia, teachers and learners' perceptions on the impact of nomophobia on the quality of teaching and learning. The study explores what determines a good quality of education? The researcher looks at the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Chapter Three provides a theoretical framework for the study and all aspects with regard to the chosen framework.

Chapter Four discusses the research methodology for the study that includes aspects such as research design, development of the research instrument, population and sample. The research methodology is based on a mixed methods design. A structured questionnaire with closed questions was given to teachers and learners that were part of the school case study. The results of the quantitative phase were triangulated with the qualitative phase that was conducted with semi structured interviews with open ended questions for both learners and teachers.

Chapter Five is the presentation and discussion/analysis of the quantitative data extracted from the study with regard to the learners and teachers' perceptions on nomophobia and its impact on the quality of teaching and learning. Data was collected, analysed and interpreted. Attempts were made to relate empirical findings to literature findings.

Chapter Six is the presentation and discussion/analysis of the qualitative data extracted from the study with regard to the learners and teachers' perceptions on nomophobia and its impact on the quality of teaching and learning. Data was collected, analysed and interpreted. Attempts were made to relate empirical findings to literature findings.

Chapter Seven presents a summary of the study, discusses in detail the findings of the study, makes recommendations, draws conclusions and explores the studies contribution to the field of education.

1.16 SUMMARY

This chapter presented an orientation of the study, with an introduction to the topic of study, rationale and background to the research problem: *How can the impact of nomophobia on the quality of teaching and learning in Gauteng schools be managed?*

This problem prompts questions which necessitate empirical investigation to provide satisfying answers and solutions to the problem. The appropriate research methodology and a suitable research design and methodology were outlined to light up a distinct path towards seeking the answers. The chapter also focused on a preliminary literature review, the statement of the problem, aims of the research, assumptions, limitations and delimitations and concept clarification. In this chapter, other considerations that were discussed were the ethical aspects of the study and the contribution of the study to the existing body of knowledge. This chapter will have succinctly described the problem and the topic generated by proffering a clear overview of the entire study.

Next, in Chapter 2, the researcher will present an in-depth literature review from the international as well as from the South African perspective relating to managing the impact of nomophobia on teaching and learning and Gauteng classrooms.

CHAPTER TWO

LITERATURE STUDY

2.1 INTRODUCTION

This chapter presents a theoretical framework for the study as it reviews relevant literature on the main issues related to the study, namely managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. International and local literature centring on the development of the concept of nomophobia will be explored. Particularly, nomophobia in the work environment and school environment, will be researched. Since addiction is closely related to nomophobia, the theories of addiction will be explored in this chapter. This chapter will examine teaching and learning theories and the quality determinants of teaching and learning. Furthermore, this chapter will address Mobile learning (henceforth referred to as M-learning) and how it should be implemented in the classroom to alleviate nomophobia. Existing frameworks for managing the use of mobile phones in the classroom will be visited.

2.2 THE CONCEPT OF NOMOPHOBIA

Nomophobia (short for 'no mobile phobia') is a word for the fear of, or anxiety caused by, not having a working mobile phone. It has been considered a symptom or syndrome of problematic digital media use in mental health, the definitions of which are not standardized (Webster, 2019). Furthermore, this fear of being without a mobile phone leads to anxiety and panic attacks in people. Nomophobia has been proposed by psychiatrists as a specific phobia that is a rising trend among high school learners (Cambridge, 2020).

According to Ali et al. (2017) psychological factors are involved in the overuse of a mobile phone. These could include low self-esteem (when individuals looking for reassurance use the mobile phone in inappropriate ways) and extroverted personality (when naturally social individuals use the mobile phone to excess). It is also highly possible that nomophobic symptoms may be caused by other underlying and pre-

existing mental disorders, with likely candidates including social phobia or social anxiety disorder, social anxiety and panic disorder.

2.3 DEVELOPMENTS IN THE CONCEPT OF NOMOPHOBIA

2.3.1 Introduction

In order to understand the impact of nomophobia on the quality of teaching and learning in Gauteng schools, it is important to consider the contexts and the societal forces that have led to nomophobia. It is also important to understand the developments in the concept of nomophobia and managing the impact of nomophobia on the quality of teaching and learning.

This discourse is relevant for the research underlying this study, as it illuminates the background and philosophical underpinnings of the impact of nomophobia on the quality of teaching and learning. It also underlines the importance of exploring the nature of teaching and learning in the classroom. Furthermore, it is important to create a framework for managing the impact of nomophobia on the quality of teaching and learning.

The first investigation of mobile phone addiction, a survey conducted by the UK Post Office in 2008, found that close to 53 percent of people in the UK suffered from a persistent, irrational fear of being disconnected from their mobile device (Bahl & Deluliis, 2019). Later, in 2012, the British cell phone company SecurEnvoy reported that as many as 66 percent of the population suffered from nomophobia that induced stress levels comparable to those felt when getting married or going to the dentist. Before these surveys were conducted and the term coined, several scholars have done pioneering work on mobile phone addiction, both theoretically and practically. A review of this extant literature indicates that nomophobia is commonly considered an *“emerging problem of the modern era”* (Dixit, Shukla & Bhagwat, 2010, p 341), or a *“disorder of the modern world”* (King et al., 2014, p 35). In this study, nomophobia is approached as a young concept with an ancient history intimately intertwined with culture, consciousness, and communication.

Nomophobia is defined as the fear of being out of mobile phone contact and is considered a modern age phobia that has been introduced to our lives as a product of the interaction between people and mobile information and communication technologies (Nagpal & Kaur, 2016). Although Nomophobia has been regarded as a controversial term, it is referred to as dependence on mobile phones (Dixit et al., 2010) or an addiction to mobile phones (Forgays et al., 2014). Wang and Suh (2018) defined it as the feelings of discomfort, anxiety, nervousness or distress that result from being out of contact with a mobile phone, even causing suicidal ideation as well as attempts. King et al. (2014) revised the definition of nomophobia to increase its modern-day relevance as a fear of being unable to communicate through a mobile phone. Nomophobia is a term that refers to a collection of behaviours or symptoms related to mobile phone use. Therefore, people with nomophobia would have an irrational fear of being out of mobile phone contact or being unable to use it, and thus they attempt to eliminate the chances of not being able to use their mobile phone. In the case of being unable to use their mobile phone, they experience intense feelings of anxiety and distress (Thomée, Harenstam & Hagberg, 2011; Szyjkowska et al., 2014).

Not surprisingly, people find that they just cannot do without their mobile phones. Nomophobia is the irrational fear of being without your mobile phone or being unable to use your phone for some reason, such as the absence of a signal or running out of minutes or battery power (Rouse, 2013). A phobia is, by definition, an irrational fear (Webster, 2019). In the case of nomophobia, the events that the user fears are not terribly unlikely, so that part of it isn't irrational; what is irrational is the degree of discomfort the users feel at the thought of being separated from their mobile phones.

2.3.2 Nomophobia in the work environment

The outcome of what happens when nomophobia starts to affect the workplace environment is important for this study as teachers are at work, and it is imperative to the understanding of how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. We then have to ask, "*What happens when nomophobia starts affecting the work environment?"*

It is easy to identify nomophobics. They frequently check to make sure the phone is within their radar- on the desk, in the pocket, everywhere they go. They use it at inappropriate places, for instance, frequently in the middle of an important business meeting checking to see if they have received a text and making sure the mobile phone has enough battery life. There are dozens of scenarios where the usage of mobile phones leads to the annoyance of others, or at the expense of productivity which has questioned the need to curb it down within the office premises (Coker, 2014).

Most corporate cultures want to provide a healthy environment of trust and freedom and enforce a uniform policy that doesn't affect work efficiency (Pravamayee, 2014). There must be clear and measurable output standards within a company. Instead of banning employees from using personal devices in order to address productivity issues (which can backfire), management can draw employees focus on appropriate workloads and deadlines without causing stress in employees' lives. In fact, expectations from the employees should always be clear from the start. Enforcing a no mobile phone usage policy can hinder their morale. There are companies that institute draconian policies who consider excessive mobile phone usage in the office equivalent to stealing company time and resources (Coker, 2014).

Wang and Suh (2018) conclude that the influence of nomophobia on employees' work-related outcomes remains unclear. They draw on the job demands-resources theory and develop a model that explores the interplay between employees' nomophobia, work engagement, emotional exhaustion, work interruption, and job productivity. The proposed model was tested using data collected from 187 employees in one organization. The results demonstrate that some employees with high levels of nomophobia feel more engaged with their work and more productive, yet others tend to be emotionally exhausted and feel they are less productive. By illuminating the dual effects of nomophobia on employees' work-related outcomes, their study extends our understanding of how mobile phone use positively and negatively affects employees in the workplace.

2.3.3 Nomophobia in the school environment

Nomophobia can have an impact on both learners and educators in the school environment. When educators display nomophobic qualities it can affect the quality of teaching and when learners display nomophobic qualities it can affect the quality of learning. The current research will determine how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

2.3.3.1 Nomophobia and learners

The research findings of Gezgin, Cakir and Yildirim (2018) imply an increase in adolescents' mobile phone addiction in the future and the potential for psychological problems among mobile phone users. When the duration of mobile phone and mobile Internet usage increase, nomophobia is more prevalent. It is thought learners cannot concentrate on their school classes and they are not motivated to complete their assignments, and in not doing so their academic performance is negatively affected.

Interestingly, Onal (2019) conducted a study in Turkey to reveal high school learners' feelings regarding their experiences of being deprived of their smartphones (nomophobia). Data obtained were analysed using the content analysis technique by the researchers simultaneously. As a result of the analyses, it is possible to say that the participants generally underwent a psychological breakdown, or felt furious, or sad in some of the nomophobia scenarios they experienced; frequently experienced intense negative feelings, such as anxiety, anger, and/or boredom; and sometimes refrain from expressing their feelings by saying "it doesn't affect me". The study yielded striking and equally thought-provoking findings such that the mobile phone has a central place in the lives of the participants, who consider being deprived of a telephone equivalent to the loss of their most beloved ones.

Gezgin et al., (2018) found that while there was not a statistically significant correlation in terms of the duration of smartphone ownership and monthly mobile internet quota, a significant difference was found in terms of the duration of mobile internet ownership, the duration of daily mobile internet use, and daily smartphone checking time. Finally, there was a statistically significant relationship between nomophobia and loneliness,

and it can be ascertained that loneliness of adolescents predicts their nomophobia levels to a certain extent.

The findings obtained from a study conducted by Yildiz-Durak (2017) is the time spent with mobile phones, the frequency of control, smartphone experience and skill are more predictive on mobile phone use disorder and nomophobia than personal factors. External factors (variables related to parents) are less predictive than the personal ones on mobile phone use disorder and nomophobia. In this study, it was found that there was a negative relationship between mobile phone use disorder and nomophobia. This finding suggests that low academic achievement may lead to problematic mobile phone use disorders in adolescents. Yildiz-Durak (2017) presented compelling evidence showing that mobile phone use disorder and nomophobia are related to academic achievement and academic achievement issues have some driven forces in mobile phone use disorders.

2.3.3.2 Nomophobia and educators

The research conducted on the impact of nomophobia among teachers is scarce. However, studies do present nomophobia prevalence among pre-service teachers. Gezgin, Sumuer, Arslan and Yildirim (2017) concluded their study by saying that both teachers and pre-service teachers are the role models for the learners and they can affect society in the same manner, thus they need to be aware of nomophobia. It is known that teachers are under pressure while planning and conducting their lessons with nomophobic learners (Okaz, 2015). Teachers should know not only the benefits of technological instructional materials, mobile learning applications etc. but also the negative effects that are caused by nomophobia. In this perspective, Spitzer (2015) discussed the role of mobile phones in the mobile learning context and claimed that the mobile phone is an often-ignored risk in the teaching and learning environment and may cause some side effects such as addiction, attention deficit disorder, empathy disorder, underachievement due to interrupted learning, hypertension, obesity, anxiety, depression, personality disorder, aggression, dissatisfaction, and loneliness. Gezgin et al., (2017) warned that preservice teachers should remember that they will be role models for learners and should know that they cannot teach efficiently and cannot

motivate themselves to deliver high quality lessons due to anxiety and fears caused by nomophobia. Hence, they should be aware of their nomophobia levels and make provision against it. From the learners' perspective, they should provide controlled mobile phone use during mobile learning activities, both in-class and out-of-class activities, by taking cognisance of emotions, behaviour, and habit differences and changes caused by mobile devices (Adnan & Gezgin, 2016).

Moreno Guerrero et al, (2020) show that future teachers are at an average level with respect to the presence of nomophobia. For this reason, their research has various implications for the academic and scientific community. Given that this population will be in charge of educating future generations in the safe and critical use of information and communication technologies, they must acquire high digital competence, as well as show a responsible use of the technologies. Most people usually spend a lot of time using their mobile phone (Kwon et al., 2016; Barnes et al,. 2019); this being more common among the young population (Ali et al., 2017), since prolonged and dependent use of it can cause physical symptoms (Mendoza et al., 2018), such as depression, pathological addiction, fear, anxiety, low productivity or poor academic performance (Duke & Montag, 2017). For this reason, it is necessary to develop prevention activities and programs that contribute to promoting controlled, conscious and responsible use from an early age, with special emphasis on teacher training. Similarly, it would be necessary to introduce educational intervention projects during the course of university studies to mitigate these problems among future teachers so that they, in turn, are able to carry them out in the classroom when they are in charge of their learners. It should be borne in mind that we are facing a study that presents some methodological limitations. This study analyses the perceptions of the subjects, so the degree of subjectivity of this type of non-experimental research must be considered (Hernández et al., 2016).

2.3.4 Effects of nomophobia on people

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM) is considered to be the gold standard manual for assessing psychiatric diseases. The DSM-5 is the product of more than 10 years of effort by hundreds of international experts in all aspects of

mental health. Their dedication and hard work have yielded an authoritative volume that defines and classifies mental disorders in order to improve diagnoses, treatment, and research (Jibson & Seyfried, 2016).

The DSM-5 Anxiety Work Group has put forward recommendations to modify the criteria for diagnosing specific phobias (Bragazzi & Del Puente, 2014). They propose to consider the inclusion of nomophobia in the DSM-5, and make a comprehensive overview of the existing literature, discussing the clinical relevance of this pathology, its epidemiological features, the available psychometric scales, and the proposed treatment. Even though nomophobia has not been included in the DSM-5 (Davies, 2018), much more attention is paid to the psychopathological effects of the new media, and the interest in this topic will increase in the near future, together with the attention and caution not to hyper-codify as pathological normal behaviours.

The term nomophobia is constructed on definitions described in the DSM-5, it has been labelled as a "phobia for a particular/specific thing" (Bhattacharya, Bashar, Srivastava & Singh, 2019, p 1298). Bhattacharya et al, (2019) explain that it is very difficult to differentiate whether a patient becomes nomophobic due to mobile phone addiction or existing anxiety disorders manifest as nomophobic symptoms. Nomophobia may also act as a proxy to other disorders. They caution that we have to be very judicious regarding its diagnosis. Some mental disorders can precipitate nomophobia also and vice versa. The complexity of this condition is very challenging to the patients' family members as well as for the physicians as nomophobia shares common clinical symptoms with other disorders. That's why nomophobia should be diagnosed by exclusion. We have to stay in the real world more than the virtual world. We have to re-establish the human-human interactions and face to face connections. So, we need to limit our use of mobile phones rather than banning it because we cannot escape the force of technological advancement.

Bragazzi and Del Puente (2014) propose that the effects and symptoms of nomophobia can range from psychological, physical, emotional and social effects and symptoms.

2.3.4.1 Psychological effects and symptoms

a) Sleep disturbances

Mobile phone addiction has been linked to an increase in sleep disorders and fatigue in users. Using a mobile phone before bed increases the likelihood of insomnia. The bright light may decrease sleep quality. Mobile phone use could increase the amount of time it takes to fall asleep, and the light emitted from the mobile phone may activate the brain (Patel, 2015).

b) Depression, anxiety, loneliness and low self-esteem

A negative feedback loop of addiction may pose problems for people who already have trouble regulating negative emotions or tend to suppress them; they may turn to the phone as a coping mechanism. Initially, this may help as a distraction, but over time, it creates a pattern that has negative impact on mental health.

People who have a ‘fear of missing out’ (coined FOMO) and ‘need for touch’ are more likely to overuse their phones. And those who overuse their phones are more likely to score higher on the depression and anxiety scales, because problematic mobile phone use may interfere with other pleasurable activities and disrupt social activities, thereby reducing behavioural activation and subsequently increasing depression (Rosenfeld, 2017).

c) Obsessive Compulsive Disorder

Malibu (2016) shows that compulsive behaviours are focused primarily on activities like texting, email, social media use and surfing the Internet. Some participants indicated that an inability to perform these behaviours produced agitation similar to that experienced in withdrawal from various substances.

2.3.4.2 Physical effects

Overuse of a mobile phone can result in a number of different physical problems that may cause permanent damage or be difficult to treat, including:

a) Digital eye strain

The pain and discomfort associated with viewing a digital screen for over 2 hours causes eyes to burn and itch. It causes blurred vision and eye fatigue. Digital eye strain can cause headaches too (Patel, 2015).

b) Neck problems

Also known as “text neck,” which refers to neck pain resulting from looking down at a mobile phone for too long (Patel, 2015).

c) Increased illnesses due to germs

Davis found that 1 in 6 mobile phones has faecal matter on it. E. coli bacteria, which can cause fever, vomiting, and diarrhoea, is found on many mobile phones. Mobile phones have been found to be contaminated with MRSA. Methicillin-resistant Staphylococcus aureus (**MRSA**) infection is caused by a type of staph bacteria that's become resistant to many of the antibiotics used to treat ordinary staph infections. It causes painful abscesses and life-threatening infections in bones, joints, surgical wounds, bloodstream, heart valves and lungs (Davis, 2018).

d) Mobile phone radiation and related illnesses

Naeem (2014) warns that mobile phones emit radiofrequency energy, a form of non-ionizing electromagnetic radiation, which can be absorbed by tissues close to the phone. The amount of radiofrequency energy a mobile phone user is exposed to depends on many factors such as the technology of the phone, the distance between the phone and the user, the extent and type of mobile phone use and the user’s distance from cell phone towers. The American Cancer Society (ACS) states that the IARC classification means that there could be some risk associated with cancer, but the evidence is not strong enough to be considered causal and needs to be investigated further. Individuals who are concerned about radiofrequency exposure can limit their exposure, including using an earpiece and limiting cell phone use, particularly among children (Johansen, Boice, McLaughlin & Olsen, 2001; Naeem, 2014).

Preliminary studies have revealed that cell phone radiation may decrease sperm count, sperm motility and viability and may lead to male infertility (Patel, 2015).

e) Other Physical symptoms

A tightness in your chest, trouble breathing normally, trembling or shaking, increased sweating, feeling faint, dizzy, or disoriented and rapid heartbeat (Legg, 2019).

2.3.4.3 Emotional effects

Emotional symptoms include worry, fear, or panic when you think about not having your phone or being unable to use it, which results in anxiousness and agitation if you have to put your phone down or know you won't be able to use it for a while. Further emotional effects are panic or anxiety if you briefly can't find your phone and irritation, stress, or anxiety when you can't check your phone (Legg, 2019).

2.3.4.4 Social effects

Social effects include:

a) Car accidents

Many people believe that they can multitask and use their phones while driving, but this causes significant impairment and puts the driver and others on the road in danger. Research has revealed that texting and driving can be just as dangerous as drinking and driving (Safewise Team, 2020).

b) Relationship problems.

Offline relationships may suffer as a result of neglect in favour of excessive cell phone and social media use. Close friends, family members or romantic partners may feel that they are being ignored, annoyed, or even pushed away. Divided attention may lead to relationship conflict (Sbarra, Briskin & Slatcher, 2019).

The effects of nomophobia are pertinent to the study as the study purports to present empirical data on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Furthermore, a workable framework must be developed to manage the effects of nomophobia on teaching and learning.

2.3.5 Criteria to determine nomophobia.

Patel (2015) regards that at least 4 of the following signs and symptoms are thought to comprise criteria for cell phone addiction, and the problematic cell phone overuse must cause significant harm in the individual's life: a need to use the cell phone more and more often in order to achieve the same desired effect; persistent failed attempts to use the mobile phone less often; preoccupation with mobile phone use; turns to mobile phone when experiencing unwanted feelings such as anxiety or depression; excessive use characterized by loss of sense of time; has put a relationship or job at risk due to excessive mobile phone use; decreased tolerance and a need for newest mobile phones, more applications, or increased use; and withdrawal, when mobile phone or network is unreachable, which results in anger.

The researcher feels it is necessary to explore the theories of addiction in order to understand managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools, as this concept is closely related to nomophobia.

2.4 THEORIES OF ADDICTION

2.4.1 Introduction

In this section, the researcher will explore the theories of addiction as they are closely related to the concept of nomophobia and will help to understand how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. In this chapter, the researcher discussed at length the concept of nomophobia. The *Diagnostic and Statistical Manual of Mental Disorders* (DSM) propose to consider the inclusion of nomophobia in the DSM-5 (cf.par.2.3.4). For this reason, the researcher has included the theories of addiction, which will add to the multi-dimensional aspect of the research creating a clear blueprint of the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Addiction is used to refer to a chronic condition where there is an unhealthily powerful motivation to engage in a particular behaviour. This can be driven

by many different factors – physiological, psychological, environmental and social (West & Brown, 2013).

Many theories of addiction have been proposed with the intention of identifying the mechanism(s) that best explain/s the behaviours observed in addicts (West & Brown, 2013). These theories frequently rely on preclinical data, primarily because they permit research into the underlying neural mechanisms in ways not possible using human subjects. The theories addressed in this research include:

- Negative Reinforcement-NR ('Pain Avoidance')
- Positive Reinforcement-PR ('Pleasure Seeking')
- Incentive Salience-IS ('Craving')
- Stimulus Response Learning-SRL ('Habits') and
- Inhibitory Control Dysfunction-IIC ('Impulsivity')

The names used for these models are descriptive and are not necessarily those originally proposed by the authors. The names in quotations are colloquial. This list is not exhaustive but serves to outline broad areas of active research.

2.4.2 Negative reinforcement

Negative reinforcement is a method that can be used to help teach specific behaviours. With negative reinforcement, something uncomfortable or otherwise unpleasant is taken away in response to a stimulus. Over time, the target behaviour should increase with the expectation that the unpleasant thing will be taken away (Marcen, 2017). For negative reinforcement to work, whatever is taken away must be taken away immediately after the behaviour in question. The end result is to get whatever behaviour is happening to continue and even increase.

Negative reinforcement provided one of the earliest theoretical explanations of addictive behaviour. The basic premise is that mobile phone use reduces withdrawal dysphoria. A more recent and sophisticated example of this model highlights the cumulative negative effects produced by repeated cycles of intoxication and

withdrawal and falls under the rubric of the opponent process theory of emotional regulation (Newton, De La Garza, Kalechstein, Tziortzis & Jacobsen, 2009).

Negative reinforcement in this context is the removal of an aversive stimuli or situation that further reinforces using the substance. An example would be that an individual first started using a mobile phone for legitimate study purposes, found the ‘euphoria’ and mood enhancing qualities that came along with it, and now despite resolving the study purpose, continues to use the mobile phone to the point of physical dependency (Bhatt, 2020).

The irony of addiction is how it starts. It often begins by using a mobile phone as experimentation, while socializing, or to feel good, the pursuit of pleasure and positive reinforcement. It’s a complex interaction of genetics versus ‘everything else’. There are so many variables and nuances that compound upon one another and can act as risk factors to develop a mobile use disorder.

2.4.3 Positive reinforcement

Positive reinforcement, based on classical learning theory, is probably the most familiar preclinical model of addiction. Quite simply, this theory states that users will say they use mobile phones because they enjoy using them (Newton et al., 2009). If someone buys a mobile phone for work related matters, they later discover they have better mood overall and continue to use the mobile phone even after the work subsides. In this case the use of the mobile phone to help their overall state of mind and outlook, that they are ‘happier’—the positive reinforcement of an improved mood can encourage misuse of mobile phones in increased amounts (Marcen, 2017). Obviously, this is dangerous. Receptors in the brain release endorphins and activates the brain’s reward system, with a rush of dopamine which rewards one with a good feeling. Once someone gets the high from the mobile phone, they often develop a cycle of pursuing that high. The physical nature of misuse of mobile phones creates changes in the brain quickly, that when one tries to stop, significant psychological and physical discomfort can occur. And once this physical dependence has been achieved, the severe discomfort of withdrawal, is often the trigger leading to a vicious cycle pursuing more misuse of the mobile phone, and facilitating addiction (Bhatt, 2020).

2.4.4 The Incentive Salience Model

The Incentive Salience model posits links between sensitization of particular brain systems and motivation, which is distilled into the concept of mobile phone craving. In this theory, the attribution of incentive salience to mobile usage stimuli is increased by exposure to mobile phones. Hence, according to Incentive Salience theory mobile phone use is attributable to craving (Newton et al., 2009; Berridge, 2017).

Incentive salience is a 'wanting' module: it is a particular subcomponent of what is ordinarily meant by the word, wanting. Incentive salience has evolved to add a visceral 'oomph' to mental desires. This is part of what makes 'wanting' as a conscious, cognitive desire. Ordinarily, incentive salience 'wanting' is congruent with other forms of desire such as cognitive wanting and is also congruent with the hedonic pleasure or 'liking' of the outcome. But dissociations can occur among all of these utility forms, and when they do incentive salience is revealed as a distinct module of desire (Berridge, 2017).

2.4.5 The Stimulus Response Learning Model

The stimulus response learning model identifies habit learning as the key to understanding addiction. In classical learning theory, stimuli and responses are associated with outcomes, and the outcome determines the likelihood that the response will follow the stimulus in the future. In stimulus response learning, the outcome is less important, and the stimulus itself elicits a habitual response. Conditioned reinforcement and impulsivity are key features of this theory. This model predicts that users will describe mobile phone usage as habitual or compulsive (Newton et al., 2009).

Lowery and DeFleur (1995) and Esser (2008) summarized the basic assumptions behind the stimulus–response theory as follows: people in a mass society lead socially isolated lives, exerting very limited social control over each other because they have diverse origins and do not share a unifying set of norms, values, and beliefs; similar to higher animals, human beings are endowed at birth with a uniform set of instincts that guide their ways of responding to the world around them; because people's actions

are not influenced by social ties and are guided by uniform instincts, individuals attend to events (such as media messages) in similar ways; and people's inherited human nature and their isolated social condition lead them to receive and interpret media messages in a uniform way.

2.4.6 The Inhibitory Control Dysfunction Model

The inhibitory control dysfunction model implicates impulsivity as the factor that underlies addiction. Impulsivity has been linked to appetitive approach systems as well as mobile phone use impairments in new learning and to perseveration. Thus, models involving inhibitory control deficits predict that users will attribute mobile phone use to impulsivity or perseveration (Newton et al., 2009).

Wegmann, Muller and Turel (2020) reiterate that the use of social media and online-communication applications has become an integral part of everyday life, some individuals suffer from an excessive, uncontrolled use of social media despite experiencing negative consequences. In accordance with neuropsychological models of addiction, we assume the tendency of a social-networks-use disorder to be related to an interplay of predisposing personality traits (e.g., impulsivity), and reductions in cognitive functions (e.g., executive functions, inhibitory control). Wegman et al. (2020) show that the symptom severity of a social-networks-use disorder is mainly associated with attentional impulsivity.

2.4.7 Summary

While a mobile phone can be a hugely productive tool, compulsive use of this device can interfere with work, school, and relationships (Ali et al., 2017). When you spend more time on social media or playing games than you do interacting with real people, or you can't stop yourself from repeatedly checking texts, emails, or apps—even when it has negative consequences in your life—it may be time to reassess your technology use (Bahl & Deluliis, 2019). Mobile phone addiction, sometimes colloquially known as 'nomophobia' (fear of being without a mobile phone), is often fuelled by an Internet overuse problem or Internet addiction disorder. After all, it's rarely the mobile phone

itself that creates the compulsion, but rather the games, apps, and online worlds it connects us to (Battacharya et al., 2019).

Despite the fact that people can experience impulse-control problems with a laptop or desktop computer, the size and convenience of mobile phones means that we can take them just about anywhere and gratify our compulsions at any time. In fact, most of us are rarely ever more than five feet from our mobile phones. Like the use of drugs and alcohol, they can trigger the release of the brain chemical dopamine and alter your mood. You can also rapidly build up tolerance so that it takes more and more time in front of these screens to derive the same pleasurable reward. Heavy mobile phone use can often be symptomatic of other underlying problems, such as stress, anxiety, depression, or loneliness (Davie & Hibber, 2017). At the same time, it can also exacerbate these problems. If you use your mobile phone as a 'security blanket' to relieve feelings of anxiety, loneliness, or awkwardness in social situations, for example, you'll succeed only in cutting yourself off further from people around you. Staring at your phone will deny you the face-to-face interactions that can help to meaningfully connect you to others, alleviate anxiety, and boost your mood. In other words, the remedy you're choosing for your anxiety (engaging with your mobile phone), is actually making your anxiety worse (Battacharya et al., 2019).

The discussion of the theories of addiction are necessary to understand managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. An exploration of the theories of teaching and learning follow in the next paragraph.

2.5 THEORIES OF TEACHING AND LEARNING

2.5.1 Introduction

This section will explore the different theoretical approaches to teaching and learning. It is important to understand the theories of teaching and learning as they relate to the research problem on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. This is pertinent to the study as the study purports to present empirical data on the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

A learning theory is defined by Zhou and Brown (2017) as a logical framework of how we come to know about learning. Behaviourism, cognitivism and constructivism are learning theories which can be applied in learning situations to cater for the needs of different learners with different learning potential to achieve intended educational goals and schools are using diverse theories to adapt to the new network society (Mann & Macleod, 2015). Firstly, these different learning theories are of great importance as they are universal models which explain how the learning process occurs in learners with different potentials and learning styles and are designed to benefit all learners by creating instructional environments. Secondly these theories, by their unique nature, can incorporate and justify the use of mobile phones as teaching and learning tools in the educational milieu. These three broad learning theories are characterised by particular principles and techniques which indicate to the teacher the instructional strategies and principles to use in teaching learners and also indicate what learners should be able to do in order to demonstrate that learning has indeed taken place. The change in behaviour and the processes of knowledge acquisition, application, knowledge construction and meaning attribution are learning outcomes which can be attained as a consequence of exposing the learner to particular learning content.

Since they were found applicable to this study, the main learning theories describing the learning process and providing teachers with instructional techniques to facilitate learning are behaviourism, cognitivism and constructivism, (Stevens-Fulbrook, 2019)). The ubiquitous nature of mobile phones in knowledge creation, sharing and distribution has led to the development of yet another learning theory, connectivism. Literature (Goldie, 2016) indicates that the various pedagogies can be used with relevant technological tools to achieve the intended goals and the 21st century learning skills. For the purpose of this study, behaviourism, constructivism and connectivism are learning theories that will be explored as they impact the quality of teaching and learning with mobile phones in the learning situation. The discussion will address learning with mobile phones from the behaviourist and cognitivist point of view and the more modern school of thought which includes constructivism and connectivism in regard to teaching and learning with mobile phones.

The integration of technological tools for teaching and learning should be informed and guided by the principles of the specific learning theories. Behaviourism as the theory which puts more emphasis on the teacher and the objectives of the lesson will be dealt with first to indicate its impact on teaching and learning and also how mobile phones can enhance teaching and learning in the teaching environment.

Teaching and learning theories are a set of principles that explain how best a student can acquire, retain and recall new information. The different theories of teaching and learning are important to this study as they will be demonstrated when different elements are identified on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Despite the fact there are so many educational theorists, there are three labels that they fall under: Behaviourism, Cognitivism and Constructivism (Stevens-Fulbrook, 2019).

2.5.2 Theories of teaching

There emerge four basic theories of teaching (Fox, 1983):

- **The transfer theory** treats knowledge as a commodity to be transferred from one vessel to another.
- **The shaping theory** treats teaching as a process of shaping or moulding learners to a predetermined pattern.
- **The travelling theory** treats a subject as a terrain to be explored with hills to be climbed for better viewpoints with the teacher as the travelling companion or expert guide.

  The growing theory which focusses more attention on the intellectual and emotional development of the learner.

These theories are reflected by, and interact with, the views that learners have of the process of learning. Whichever theory a teacher uses to help him/her think about the process, it will affect the strategies she/he uses, and it will colour his/her attitudes to learners and to any training programme that she/he undertakes. It is suggested that the conceptual models presented will assist in the resolution of misunderstandings and differences between teaching colleagues and between teachers and learners. The

theories of teaching and learning will allow the current study to bridge the gap between the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms, by creating a framework for managing nomophobia in the classroom.

2.5.3 Theories of learning

2.5.3.1 Behaviourism

Behaviourism is based on the idea that knowledge is independent and on the exterior of the learner. In a behaviourist's mind, the learner is a blank slate that should be provided with the information to be learnt. Through this interaction, new associations are made and thus learning occurs. Learning is achieved when the provided stimulus changes behaviour (Woolfolk, 2014). A non-educational example of this is the work done by Pavlov. Through his famous 'salivating dog' experiment, Pavlov showed that a stimulus (in this case ringing a bell every time he fed the dog) caused the dog to eventually start salivating when he heard a bell ring. The dog associated the bell ring with being provided with food so any time a bell was rung the dog started salivating, it had learnt that the noise was a precursor to being fed (Stevens-Fulbrook, 2019). Behaviourism involves repeated actions, verbal reinforcement and incentives to take part.

2.5.3.2 Cognitivism

In contrast to behaviourism, cognitivism focuses on the idea that learners process information they receive rather than just responding to a stimulus, as with behaviourism. There is still a behaviour change evident, but this is in response to thinking and processing information. Cognitive theories were developed in the early 1900s in Germany from Gestalt psychology by Wolfgang Kohler. In English, Gestalt roughly translates to the organisation of something as a whole, that is viewed as more than the sum of its individual parts. Cognitivism has given rise to many evidence-based education theories, including cognitive load theory, schema theory and dual coding theory as well as being the basis for retrieval practice (Woolfolk, 2014).

In cognitivism theory, learning occurs when the student reorganises information, either by finding new explanations or adapting old ones. This is viewed as a change in knowledge and is stored in the memory rather than just being viewed as a change in behaviour. Cognitive learning theories are mainly attributed to Jean Piaget. Examples of how teachers can include cognitivism in their classroom include linking concepts together, linking concepts to real-world examples, discussions and problem-solving (Stevens-Fulbrook, 2019).

2.5.3.3 Constructivism

Constructivism is based on the premise that we construct learning new ideas based on our own prior knowledge and experiences. Learning, therefore, is unique to the individual learner. Learners adapt their models of understanding either by reflecting on prior theories or resolving misconceptions. Learners need to have a prior base of knowledge for constructivist approaches to be effective (Steven-Fulbrook, 2019). A spiral curriculum is a great example of constructivism in action. As learners are constructing their own knowledge base, outcomes cannot always be anticipated, therefore, the teacher should check and challenge misconceptions that may have arisen. When consistent outcomes are required, a constructivist approach may not be the ideal theory to use. Examples of constructivism in the classroom include problem-based learning, research and creative projects and group collaborations (Woolfolk, 2014).

2.5.3.4 Connectivism

Research findings reported by Goldie (2016) indicate that in a M-Learning teaching and learning situation, teachers' mobile phone competencies and attitudes determine the successful use of M-learning in the classroom. This assertion confirms that teachers are indeed in control and central figures in ensuring that ICTs are integrated in the teaching and learning situation. Teachers are still important in the connectivist environment to guide learners with regards to what content learners need.

Despite cultural differences in learning, connectivism occurs through the use of both the cognitive and affective domains as cognition and emotions contribute to the learning act in significant ways. This is indicated by the cycles of forethought, execution and volitional control and self-reflection which address motivational and behavioural characteristics to achieve set educational goals (Mukhari, 2016). Learners, not the teacher or institution, will be at the centre of the learning experience. Consequently, learners will be instrumental in determining the content of the learning in addition to deciding the nature and levels of communication and who can participate.

The learning process is influenced by the diversity of networks and transfer occurs through the process of connecting. In furtherance, the learning process is cyclical in that learners connect to a network to share and find new information, modify their beliefs on the basis of new learning, and then connect to a network to share these realisations and find new information once more (Matusik, 2011)). Goldie (2016) sees the learning process in connectivism as characterised by connecting information sets and by helping learners to see the connection between events and ideas. Since knowledge rests in a diversity of opinions, learning is therefore a process of connecting specialised nodes or information sources.

2.5.4 Summary

The theories of teaching and learning provide a basis to understand how people learn and a way to explain, describe, analyze and predict learning. In that sense, a theory helps us make more informed decisions around the design, development and delivery of learning (Stevens-Fulbrook, 2019). Educational research is used to create the theories upon which we design educational policies and practices. Theories help to organize relevant empirical facts (empirical means they can be observed or measured) in order to create a context for understanding phenomena (Zhou &Brown, 2017). The theories of teaching and learning are pivotal to this research as they provide a sound basis for practical action, and they guide and give meaning to what we see. The discussion of the theories of teaching and learning are necessary to understand managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

The determinants of the quality of teaching and learning are integral to this study and therefore an exploration of the determinants of the quality of teaching and learning follows in the next section.

2.6 DETERMINANTS OF THE QUALITY OF TEACHING AND LEARNING

2.6.1 Introduction

It is important to understand the dynamics of measuring the quality of teaching and learning. To this end, this section will examine the determinants of the quality of teaching and learning. Furthermore, the indicators of the quality of teaching and learning will be examined to determine how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

The researcher concurs that the most important school related factor influencing student achievement is the quality of teaching and learning that takes place in the school environment. Quality in teaching and learning can be seen in the way the knowledge, skills and ability of the teacher are employed to develop meaningful pedagogic experiences for learners. Such experiences are evident when teaching impacts learning and learning influences teaching (Zhou & Brown, 2017).

2.6.2 The quality of learning

2.6.2.1 Defining quality

Understanding what quality means varies between countries. Different education actors and organizations also have their own definitions. However, most tend to agree on three broad principles: the need for relevance, for equity of access and outcome, and for proper observance of individual rights (UNESCO, 2019). UNESCO's framework on the variables of education quality has five dimensions:

- **Learner Characteristics**: including learner aptitude, perseverance, readiness for school, prior knowledge, barriers to learning, and demographic variables.

- **Context:** including public resources for education, parental support, national standards, labour market demands, socio-cultural and religious factors, peer effects, and time available for schooling and homework.
- **Enabling Inputs**: including teaching and learning materials, physical infrastructure and facilities, and human resources.
- **Teaching and Learning**: including learning time, teaching methods, assessment, and class size.
- **Outcomes**: including skills in literacy and numeracy, values, and life skills.

Thus, the dimensions of learner characteristics, context, enabling inputs, teaching and learning and outcomes, are important constructs for this study as it highlights managing the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

2.6.2.2 The use of indicators

For educational quality and learning outcomes to improve, planners need access to evidence-based analysis of the current situation, trends over time, and information on the strengths and weaknesses of a system, and their causes. A strong monitoring and evaluation system that looks at relevant indicators can provide that evidence. Indicators can help track the progress of strategies and programmes within an education sector plan. Indicators of education quality can have meaningful implications for policy by enabling comparisons to be made across time, within different places or contexts, or against standards or global benchmarks. More specifically, indicators enable educational planners and decision-makers to (Kaagan & Smith, 1985; UNESCO, 2019):

- Monitor changes in areas such as teaching quality, the curriculum, and student performance, which can alert policy makers to impending problems.
- Measure the impact of educational reform efforts.
- Encourage an education system to improve by comparing it, or parts of it, with other countries or systems.
- Focus attention on educational subsystems that may require improvement, such as particular districts or levels of education.

- Focus attention on key equity indicators, such as the performance of different subgroups such as girls, learners living in poverty, or learners with disabilities.

2.6.2.3 Indicators for monitoring education quality

Education systems are typically analysed in terms of context, specific inputs, social or institutional processes, and outputs or outcomes. Indicators can be developed to measure issues that fall under each of these categories (Scheerens, Luyten & Van Ravens, 2011; UNESCO, 2019):

- **Context indicators**: provide information on the contextual factors that affect learning, e.g., student characteristics, socio- economic conditions, cultural aspects, status of the teaching profession, and local community issues. Context indicators are often challenging to develop and measure as they concern qualitative issues. Common data-collection tools include surveys, classroom observations, inspection reports, and self-evaluations.
- **Input indicators**: primarily measure the deployment and use of resources to facilitate learning. They reveal whether the planned financial, material, and human resources are being delivered in the planned quantities, at all levels of the system. Information on input indicators is relatively easy to obtain since inputs are often 'countable' by nature, and management processes involve keeping records of many inputs automatically. One challenge may be the differences between producing inputs and ensuring that they are available at the endpoint. For example, the textbook/pupil ratio may be measured in terms of the number of textbooks that are delivered, or by the number of textbooks in use in schools. In some cases, there may be a discrepancy between the two figures.
- **Process indicators**: measure how educational programme activities were conducted – whether they were carried out to the desired standard of quality. This includes how specific educational processes are conducted in practice, e.g., the application of standards, teaching quality, time on task, school climate, and educational leadership. Like context indicators, process indicators also concern qualitative issues and may be obtained through surveys and pedagogical observations, inspection reports, and self-evaluations.

- **Output indicators**: measure the effects of the programme activities to see whether the programme objectives were attained. They reveal how the education system is performing in terms of subject knowledge, competencies, repetition, progression and completion rates, and employer satisfaction. Output indicators may be obtained through national examinations, international assessments, surveys, and systematic field observations. Output indicators typically involve measurement of learning outcomes based on national examinations or international assessments. Output indicators provide the most important data for understanding whether educational quality and learning outcomes are improving as intended.

Indicators should be based on context and on the specific learning goals of the education system. They should be designed to allow for measurement of change over time and be disaggregated by gender, geography, socio-economic situation, and other equity issues. This research aims at addressing the quality of learning that will assist in managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

2.6.3 The quality of teaching

Quality in teaching can be defined, very simply, as activities that promote student learning. It encompasses all those teacher behaviours that encourage learners to learn and move towards the institution's educational objectives. Ideally, the learners will also share at least some of their objectives and goals (National Academic Press, 2015).

Loughran (2018) articulates that to the casual observer, teaching may look simple, but the reality is that it’s a highly complex and sophisticated business. Quality in teaching and learning can be seen in the way the knowledge, skills and ability of the teacher are employed to develop meaningful pedagogic experiences for learners. Such experiences are evident when teaching impacts learning and learning influences teaching. That dynamic relationship is dramatically different to the singular, one-way events of ‘telling’ and ‘listening’.

Quality in teaching and learning requires an ability to:

2.6.3.1 Create a need to know in learners so they genuinely engage in learning

Knowing how to create an invitation to learners to learn so they develop curiosity and interest in a subject is crucial (Daniels, 2010). Moving learners from being passive absorbers of information to active, thoughtful learners who question content and build their knowledge of an area is crucial to independence in learning – a hallmark of a successful learner.

2.6.3.2 Develop ways to engage a diversity of learners at the same time

This, despite the inevitable variety of entry points to engagement in a subject, range of levels of interest, motivation and attitudes to the content, and perceived ability and style of learning (Westwood, 2018). This is demanding work. Think, for example, about when a doctor diagnoses a patient – it's through a one-on-one consultation. However, when a teacher seeks to diagnose learners' learning needs, it's through a one-to-many (class size matters) – and it happens multiple times every day.

2.6.3.3 Draw out and use learners' prior knowledge

Learners don't enter the classroom as a blank slate. They come with pre-existing ideas, views, opinions, experiences and alternate facts that a teacher must be able to draw out and work with, in order to build meaningful learning. Building integrated, well-connected, relevant and useable knowledge of a subject is central to ensuring that such knowledge can (and will) be applied in the world that exists beyond the classroom walls. That means information must be processed, not just remembered (Lee, Coomes &Yim, 2019). Linking content with experiences across contexts matters and translating ideas from one situation to another (e.g., from the abstract to the concrete) begins to highlight the complexity of teaching and how expert practice shapes quality student learning.

2.6.3.4 Conceptual understanding of content

A strong indication of a deep knowledge of a subject is evident in a person's conceptual understanding, and that goes well beyond simply knowing the facts. Working at the big-picture level means a teacher must know how to conceptualise the central ideas that shape deeper understandings of a subject (Nola, 2019). Purposefully making clear that which is intended to be learnt, how and why; recognising and responding to learners' difficulties in understanding concepts; being knowledgeable of, and adept at, a range of teaching procedures to foster learning; and being able to ascertain learners' understanding requires the development of pedagogical content knowledge – something that again draws attention to the specialist knowledge of the expert teacher.

2.6.3.5 Building trusting relationships and safe learning environments

Just as quality can be seen in the way a teacher creates a dynamic relationship between teaching and learning, the same exists in the trusting relationships that must be fostered and developed between teacher and learners, as well as learner to learner. To be able to support learners to publicly share their ideas, speak up about uncertainty and work through their doubts and confusion requires a teacher to possess interpersonal skills that foster trust and confidence. Again, this offers insights into the sophisticated nature of their knowledge, skills and ability (Mitchell, Kensler & Tschannen-Moran, 2018).

The Norms and Standards for Educators (2000) policy describes the roles, their associated set of applied competences (norms) and qualifications (standards) for the development of educators. It also establishes key strategic objectives for the development of learning programmes, qualifications and standards for educators. The list of roles and their associated competences below is meant to serve as a description of what it means to be a competent educator. It is not meant to be a checklist against which one assesses whether a person is competent or not. The roles and competences must be integrated in the learning programme and should inform the exit level outcomes of a qualification and their associated assessment criteria. Ultimately, the qualification should reflect an applied and integrated competence. This demonstrated

ability to integrate theory and practice in teaching must be assessed within all educator qualifications.

2.6.4 The seven roles of an educator

2.6.4.1 Learning mediator

The educator will mediate learning in a manner which is sensitive to the diverse needs of learners, including those with barriers to learning; construct learning environments that are appropriately contextualised and inspirational; communicate effectively showing recognition of and respect for the differences of others (Ariffin, Bush & Nordin, 2018). In addition, an educator will demonstrate sound knowledge of subject content and various principles, strategies and resources appropriate to teaching in a South African context (Norms and Standards for Educators,2000).

2.6.4.2 Interpreter and designer of learning programmes and materials

The educator will understand and interpret provided learning programmes, design original learning programmes, identify the requirements for a specific context of learning and select and prepare suitable textual and visual resources for learning (Norms and Standards for Educators, 2000; Nola, 2019). The educator will also select, sequence and pace the learning in a manner sensitive to the differing needs of the subject/learning area and learners (Ariffin et al., 2018).

2.6.4.3 Leader, administrator and manager

The educator will make decisions appropriate to the level, manage learning in the classroom, carry out classroom administrative duties efficiently and participate in school decision making structures. These competences will be performed in ways which are democratic, which support learners and colleagues, and which demonstrate responsiveness to changing circumstances and needs (Nola, 2019).

2.6.4.4 Scholar, researcher and lifelong learner

The educator will achieve ongoing personal, academic, occupational and professional growth through pursuing reflective study and research in their learning area, in broader professional and educational matters, and in other related fields (Norms and Standards for Educators,2000).

2.6.4.5 Community, citizenship and pastoral role

The educator will practise and promote a critical, committed and ethical attitude towards developing a sense of respect and responsibility towards others. The educator will uphold the constitution and promote democratic values and practices in schools and society. Within the school, the educator will demonstrate an ability to develop a supportive and empowering environment for the learner and respond to the educational and other needs of learners, and fellow educators (Porciani, 2017). Furthermore, the educator will develop supportive relations with parents and other key persons and organisations based on a critical understanding of community and environmental development issues.

2.6.4.6 Assessor

The educator will understand that assessment is an essential feature of the teaching and learning process and know how to integrate it into this process. The educator will have an understanding of the purposes, methods and effects of assessment and be able to provide helpful feedback to learners. The educator will design and manage both formative and summative assessment in ways that are appropriate to the level and purpose of the learning and meet the requirements of accrediting bodies. The educator will keep detailed and diagnostic records of assessment. The educator will understand how to interpret and use assessment results to feed into processes for the improvement of learning programmes (Hussain, Shaheen, Ahmad & Islam, 2019).

2.6.4.7 Learning area/subject/discipline/phase specialist

The educator will be well grounded in the knowledge, skills, values, principles, methods, and procedures relevant to the discipline, subject, learning area, phase of

study, or professional or occupational practice. The educator will know about different approaches to teaching and learning (and, where appropriate, research and management), and how these may be used in ways which are appropriate to the learners and the context. The educator will have a well-developed understanding of the knowledge appropriate to the specialism (Ariffin et al., 2018).

2.6.5 Summary

Effective instruction is important to promote excellence in student learning outcomes through best teaching and learning practices. Teaching and learning that is purposeful provides learners with the ability to effectively learn, retain skills and gain knowledge. It is usually associated with or based on student satisfaction with the learning process (Killen, 2015). In this study, the indicators of quality for teaching and learning are viewed as essential to understand the philosophical underpinnings of managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Mobile learning is pivotal to understanding the balance that is required from managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. For this reason, the next section will explore mobile learning in the classroom.

2.7 MOBILE LEARNING (M-LEARNING) IN THE CLASSROOM

2.7.1 Introduction

This section will explore the theoretical approach to M-learning. It also includes the history of M-learning, the policies of M-learning in South Africa, the benefits and challenges of M-learning in classrooms. This is pertinent to the study as the study purports to present empirical data on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Mobile learning is a new learning paradigm that exploits the use of mobile devices in education (Furio Ferri et al., 2015). Mobile learning or M-learning is any type of content that is developed or consumed on mobile devices, such as mobile phones or tablets, and including anything from podcasts to full eLearning courses. Laskaris (2018) expands on the benefits of M-learning. He is of the opinion that M-learning offers

learners flexibility to learn at their own pace; better completion rates and higher retention; allows for collaborative learning; higher engagement; multi-device support; performance support and a learning path.

M-learning also brings strong portability by replacing books and notes with small devices, filled with tailored learning contents. M-learning has the added benefit of being cost effective, as the price of digital content on tablets is falling sharply compared to the traditional media (books, CD and DVD, etc.). One digital textbook, for instance, costs one-third to half the price of a paper textbook, with zero marginal cost (Saylor, 2012)

2.7.2 History of M-Learning

Concepts of M-learning were given by Alan Kay in the 1970s. He joined Xerox Corporation's Palo Alto Research Centre and formed a group to develop ‘Dynabook’, which is a portable and hands on personal computer. It aimed to let children have access to the digital world (Maxwell, 2006). This project failed eventually due to the lack of technological support at that time. Until 1994, the first mobile phone, IBM Simon, was created by Mitsubishi Electric Corp. It was defined as a handheld personal communicator. From then on, technological companies started to design the so-called ‘smartphones’. The creation of the mobile phone provided the platform for M-learning, and the current of mobile device innovation pushed M-learning to project and research status.

Chronologically, M-learning research has been characterized into three phases: first phase is the focus upon devices; second is the focus on learning outside the classroom; third phase is the focus on the mobility of the learner (Murray & Olcese, 2011). At its second phase, around 2005, a tremendous number of projects had been completed. These projects mainly targeted the effects of M-learning, like motivation to learn, engagement in learning activities and focus on special needs people. This set the tone for mobile learning where M-learning transferred from project status to mainstream education and training (Saylor, 2012).

2.7.3 M-learning policies and practices in South African classrooms

UNESCO has initiated work in this area by providing guidelines on the use of mobile technology for learning (Aluko, 2017). The main purpose of these guidelines, which were the outcome of a UNESCO Nokia partnership focusing on African and Middle East (AME) countries, is to help countries develop their own approaches to mobile learning (UNESCO, 2011). Although the guidelines are now in the public domain, the onus rests on each country to take the initiative to adapt these guidelines to its own context. Given the ubiquity of mobile technology, it appears that countries would generally have no choice but to take this step. South Africa could be said to be one of the more 'advanced' countries in Africa in terms of the availability of mobile phones and bandwidth, even though it is not without its challenges. Although the country has publicly acknowledged the place of open and distance learning (ODL) in mending its education system, it has only recently enacted a policy on ODL – a delivery mode that adopts the use of technology in higher education (DHET, 2014).

Although South Africa could be said to be more advanced with regard to M-learning than many other African countries, findings reveal that South Africa, like most African countries, does not have a dedicated policy on mobile learning (Aluko, 2017). In most instances, it seems that regulations for the use of this technology are left in the hands of individual providers (UNICEF, 2012). One of the ways in which an enabling environment could be created is to develop policies that ensure delivery on mandates. Therefore, it seems that a policy vacuum needs to be filled.

The Gauteng Department of Education (GDE, 2011) and the South African Schools Act (DoE, 1996) has issued guidelines for a mobile phone policy for learners. The guidelines allow learners to bring mobile phones to school and do not place a ban on the use of mobile phones at school. The guidelines acknowledge that mobile phones can cause distractions, cyber-bullying, theft and cheating. There is no mobile phone policy for teachers from the GDE, however, individual schools do have their own policies (Anon, 2014).

2.7.4 Benefits of mobile learning in the classroom

The benefits of mobile learning in schools have been illuminated by Steel (2012) and Keengwe and Bhargava (2014):

2.7.4.1 Anytime and anywhere learning

One of the immediate advantages of mobile learning is that learners are not confined to a classroom or a set schedule to be able to learn. Neither are teachers! Mobile learning means that learners are able to log into classrooms at their convenience to go through course materials or take a test. Similarly, teachers are able to communicate on the go with learners to clear their doubts, administer tests, or even communicate with a student's parents about their child's progress (Laskaris, 2018).

This all-round, anytime and anywhere accessibility means that learning is not confined to a physical location or a specific time. Instead, learners can learn on the go at a pace that works for them. This results in learners engaging voluntarily on their own terms – which means that they feel empowered by the learning process instead of it just being another day in school (Laskaris, 2018).

2.7.4.2 Digital-first thinking

The current workforce comprises a large swathe of Millennials. These are employees who have grown up around technology and are used to using it in their everyday life. They are comfortable with engaging with digital devices, mediums, and platforms to make their work easier and better. Why should this not start at school? Mobile learning is tailored to the way Millennials work and think (Gautam, 2018). It makes learning more accessible for them and prepares them to enter the workforce ready for the real world. Mobile learning is at the heart of embracing a forward-thinking, digital-first approach to life. It ensures that learners who engage in mobile learning are ready for the real world and are able to cope with it better than Luddites who are scared of technology.

2.7.4.3 Dynamic teaching methodologies

Mobile learning is extremely friendly to newer and modern teaching methodologies. It is extremely friendly towards visual learning, since it so easily supports audio, video, and images (Laskaris, 2015; Gautam, 2018). This means that content built for mobile learning is inherently dynamic. These fast-paced, visually engaging graphics have been found to be more engaging for learners in a classroom – it keeps their attention and conveys course material in an effective fashion.

Mobile learning also allows for more modern teaching methodologies like the use of dynamic content and experiential learning to be implemented more easily in the classroom. This means that classrooms are experiencing cutting-edge teaching instead of relying on old and outmoded teaching methods that might not be as effective – all thanks to mobile learning (Kang & Yung, 2014; Yildiram & Correira, 2015).

2.7.4.4 Personalisation of learning

One of the best things about M-learning is its flexibility (AlZwamri & Hussain, 2017). Teachers and learners are able to learn on the go and at their own pace. Different types of teaching methods and dynamic material can be used to great effect. All this flexibility means that mobile learning is perfect for personalising learning. Personalised learning means that learners are able to use their personal mobile learning devices to access course materials, test, content, etc that have been tailored to their taste and abilities (Mendoza et al., 2018).

Why do we need personalised learning, to begin with? As we study education more, we understand that it is not helpful to stereotype learners or categorise them into groups that are too broad. Learners are diverse in nature, with diverse abilities and needs – M-learning, thanks to its inherent flexibility, is better able to address this diversity in thinking (Pitichat, 2013).

2.7.4.5 Covid -19 mobile learning advantage

As an educator at a public school in Gauteng, the researcher feels that using M-learning during the Covid-19 pandemic lockdown, when schools were closed and afterwards

when schools allowed learners to return on a rotational basis, was indeed a blessing. Teachers that did not use M-learning platforms put themselves under tremendous pressure to complete the syllabus and also put their learners at a considerable disadvantage when syllabus could not be completed. The researcher made extensive use of WhatsApp groups and did personalised videos for learners, and online tests with learners were conducted.

2.7.5 Challenges of mobile learning in the classroom

The challenges of allowing mobile phones in schools have been expounded by Kumar (2011) and Synnott (2018):

2.7.5.1 Increasing reliance on technological tools.

While a forward-thinking, digital-embracing approach to education with M-learning is found to be undeniably useful, it also results in learners losing touch with older skills that do not rely on technology (Khalife, 2017). This is especially the case for trade skills like handymen skills, woodworking, working in arts and crafts etc. This is a serious loss in terms of some types of skills dying out and, thus, becoming more and more expensive in the marketplace (Lee et al., 2017).

2.7.5.2 Distracted learning

Unfortunately, one disadvantage of M-learning is that it merely increases the amount of screen time a student indulges in one day. While, on the one hand, we actively try to reduce time spent in front of a computer, mobile, tablet, or TV screen for learners – especially those that are younger – M-learning necessitates that learners spend time in front of a screen to learn. Screen time can be habit-forming and, in some cases, addictive (Khalife, 2017; Lin & Li, 2019). M-learning must thus be regulated by keeping in mind the other hours a learner spends in front of a screen.

2.7.5.3 Multitasking hurts recall of course material.

Multitasking – another side effect of M-learning – has also found to be not conducive to recall and retention of material. In fact, studies show that in some ways, note taking

using a pen and paper really does result in a better recall. M-learning content should, thus, be built in a way that helps address distracted learning (Matusik & Mickel, 2011; Lee et al., 2014).

2.7.5.4 Covid-19 mobile learning challenges

The researcher found that during the Covid-19 pandemic learners who did not benefit from mobile learning were those that ran out of data, or those that just did not want to learn. The challenges of M-learning are the same as the classroom challenges, getting learners to be intrinsically motivated towards their studies.

2.7.6 Summary

Mobile learning offers ultimate accessibility and flexibility to learners. Learners can access M-Learning courses anytime, anywhere via their mobile devices, meaning that they don't have to necessarily take the courses during office hours. Mobile learning improves learner motivation that in turn, increases the willingness to take the courses. Researchers have also relayed the challenges of M-Learning which include software issues, hardware issues, distractions, misuse and lack of internet connection or electricity. The constructs of M-learning are important to gain an understanding of how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

2.8 EXISTING FRAMEWORKS FOR MANAGING THE USE OF MOBILE PHONES IN THE CLASSROOM

2.8.1 Introduction

It is important to note the existing frameworks for managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. While several researchers have created frameworks for managing the impact of nomophobia (Abeele & Van Rooij, 2016; Gezgin et al., 2018; Davies, 2018), the final framework for this study will be presented in the final chapter. The conclusions of these researchers are noted and taken cognisance of and will be used for comparison and reference purposes.

2.8.2 The possible treatment of nomophobia

Gezgin et al. (2018) conclude that educational seminars must be given at schools and solutions need to be proposed with the contribution of all related parties in order to fight against the prevalence of nomophobia, which is considered as one of the key technology-related problems of the coming age. In general, survey studies are important to define the current characteristics and status of the study group. In educational settings, understanding the characteristics of learners allows teachers and practitioners to develop interventions to improve student learning. Considering the current dissemination of mobile learning applications in education, learners mobile phone use behaviours have become a considerable issue for educators. While educational institutions give more space for mobile applications in learning environments, they are also aware that learners' Internet addiction stands as a major barrier for such applications to be used effectively. Thus, understanding factors that contribute to Internet addiction and nomophobia among learners will yield better use of mobile applications in an educational context in the future (Abeele & Van Rooij, 2016).

Therapies for nomophobia range from interpersonal counselling, cognitive behavioural therapy, and addiction therapy (Davies, 2018). Exposure therapy can also be used, first exposing the individual to their phobia in therapy (i.e., not taking the phone in the room with them) and gradually moving to real-life scenarios (i.e., moving the phone to another room for gradually increasing amounts of time). Mindfulness has been found to reduce nomophobia tendencies, particularly among women.

Another intrinsic aspect of treating nomophobia is self-help, and clinicians can educate patients on how to take control of their phone rather than their phone having control over them (Li, Lepp & Barkley, 2015; Gezgin, 2018):

- **Timing:** Patients can be helped to refrain from checking their phone for a few hours daily, especially at night.
- **Social Media:** Social media browsing can be limited to help individuals learn to connect in other ways.

- **Notifications:** Individuals who keep glancing at app notifications can be encouraged to turn them off. The more notifications, the more drawn they will be to their device and the more stress they are likely to experience.
- **Declutter:** If a device is packed with photos, apps, and games, it can be useful to explore the feelings associated with deleting some of these. This can facilitate a gradual decluttering process of both their phone and their mind.

Of course, in a state of addiction, these seemingly simple steps may not be easy to implement. According to one study, approximately 47% of smartphone users in the United States attempted to limit usage, but only 30% succeeded. With increasing research in the area, public awareness is on the rise regarding the conscious need for self-regulating smartphone use. In China, for example, digital detox camps are common. There are also apps, such as *Hold,* that provide incentives for lowering phone usage (Gezgin, 2018).

2.8.3 Managing M-learning in the classroom.

The purpose of integrating M-learning in the classroom has been stated as being "*to improve and increase the quality, accessibility and cost-efficiency of the delivery of education, while taking advantage of the benefits of networking learning communities together to equip them to face the challenges of global competition*" (Lloyd, 2005, p2; Matwadia, 2018).

In order to understand the move towards including M-learning in the classroom, it is important to consider the global contexts and the societal forces that led to this movement. It is also important to understand the way in which including M-learning in the classroom impacts on the levels of teachers and learners' nomophobia, and whether the inclusion of M-learning in the classroom does indeed improve the quality of teaching and learning.

This discourse is relevant for the research underlying this study, as it illuminates the background and the philosophical underpinnings of the move towards including M-learning in the classroom. It also underlines the importance of exploring the nature of the level of nomophobia encountered by teachers and learners working with M-learning

in the classroom. There is a need for constant collaboration and communication among all the stakeholders in the process of including M-learning in the classroom (Chai, Koh, Lim & Tsai, 2014; Matwadia, 2018).

2.8.4 The expanded TPACK framework of digital media in the classroom

For the purpose of this study the theoretical framework for the study of digital media in classrooms as advocated by Chai et al. (2014) will be used.

2.8.4.1 Understanding the TPACK framework.

TPACK is an approach to designing M-learning that recognizes the complex issues that teachers face in the classroom (Mishra & Koehler 2006, Chai et al., 2014; Matwadia, 2018). Six types of knowledge can be drawn upon to form TPACK. TPACK begins with three foundational forms of knowledge, namely TK (technological knowledge), PK (pedagogical knowledge), and content knowledge (CK). However, educators also need to draw upon the intermediate knowledge formed through two interacting types of foundational knowledge to create TPACK. These intermediate forms of knowledge are technological pedagogical knowledge (TPK), technological content knowledge (TCK), and pedagogical content knowledge (PCK). TPK denotes the PK associated with the use of specific ICT (e.g., how to facilitate learning with discussion forums); TCK denotes technological knowledge embedded with CK (e.g., Google Earth for geography); while PCK refers to knowledge about how to teach certain content to specific groups of learners (e.g., using water flow to teach the concept of electric current).

TPACK may be formed through multiple pathways depending on the breadth and depth of the teachers' existing knowledge; the more knowledgeable an educator, the more easily he/she could formulate an M-learning lesson. If the educator possesses more knowledge of the technology, pedagogy, and content, as well as the interrelated knowledge, he/she will be able to design more appropriate artifacts for M-learning in education (Chai et al., 2014).

For any lesson to achieve optimal outcomes, the teachers cannot rely on the standardized application of a pre-designed lesson but must customize the lesson to

suit the learners' profile, such as their prior knowledge. In other words, TPACK is an epistemologically dynamic and situated form of knowledge (Mishra & Koehler, 2006). Teachers with constructivist beliefs have been found to be more inclined to use M-learning as cognitive tools. As TPACK is usually constructed by teacher design teams, the interpersonal dimension could also impact the TPACK development.

TPACK does not take into account contextual variables associated with the cultural categories, education stakeholders' expectations of teaching and the examination-oriented culture. Many categories of contextual variables may shape teachers' design decisions. Therefore, to deepen the understanding of ICT integration, Chai et al., (2014) propose an expanded TPACK framework that considers a wider meaning of 'context', such as the inclusion of interpersonal or cultural factors.

2.8.4.2 The expanded TPACK framework

In line with Porras-Hernandez and Salinas-Amescua's (2013) theorization, the 'context' in TPACK can be delineated in terms of (a) actor, and (b) scope. The actor refers to the stakeholder in the system, who requires some form of TPACK in order to shape ICT integration. The current research on TPACK is confined to teachers as the main subject while ignoring the other actors in the education system. These actors include the student, the curriculum designer, the head of department, the school principal, ministry officers, software designers, parents, and industry partners. These other actors need to understand TPACK so that they can contribute to the design of curriculum guidelines, policies, infrastructure and physical space allocation, etc. in order to achieve ICT integration.

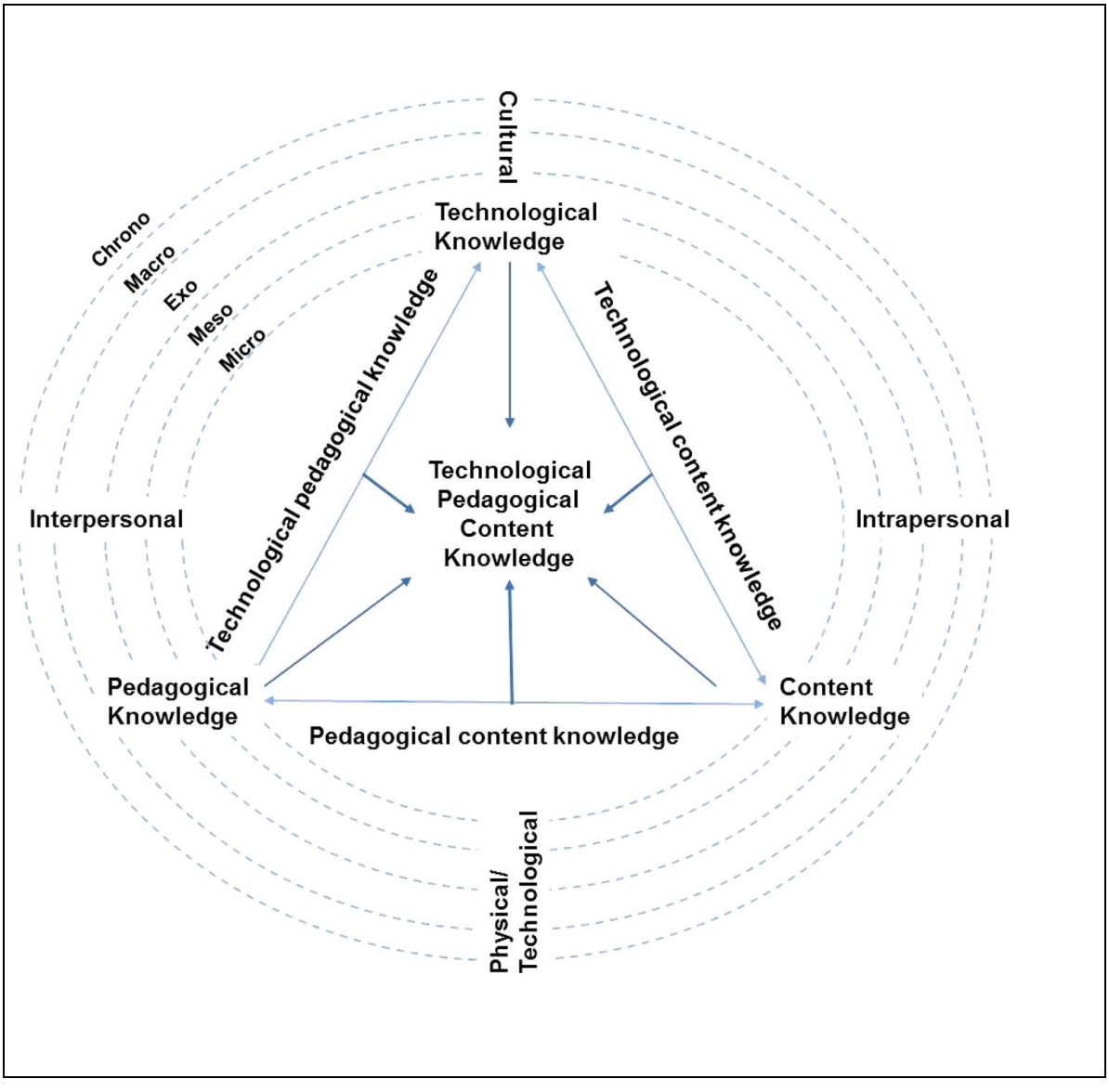
Porras-Hernandez and Salinas-Amescua (2013) criticized the research in TPACK as defining the teachers' work context too narrowly and proposed that researchers should employ Bronfenbrenner's ecological approach (Bronfenbrenner, 2005) to consider how different levels of context could impact on teachers' TPACK. They focused on three levels of Bronfenbrenner's framework, namely the micro-level (i.e., the classroom), the meso-level (i.e., the local community and the educational institution), and the macro level (i.e., the social, technological, and political environments). Their research also attempts to illustrate through the phenomenological approach how teachers view the

various context levels. Bronfenbrenner's ecological approach, also known as the ecological systems theory, provides an influential and systematic scope for TPACK.

The ecological approach is a model of human development with the child at the center of the system. It consists of five rings of interconnected systems, namely the microsystem, mesosystem, exo-system, macrosystem, and chronosystem, which shape the child's psyche. Bronfenbrenner (2005) theorized that the microsystem is one immediate environment of the child, e.g., the home, family, or peer group. The mesosystem is the relationship between two or more microsystems, such as the link between home and school. The exo-system refers to the linkages between the microsystem, and an environment that the child does not reside in, e.g., the home and the parent's workplace. The macrosystem consists of the wider processes and patterns prevalent in the micro-, meso-, and exo-systems such as belief systems, customs, lifestyles, and policy structures. Lastly, the chronosystem emphasizes the passage of time and is a slightly different dimension from the earlier levels. This historical context examines both the change in the child over time as well as the change in the environment in which the child lives. Bronfenbrenner's ecological system has enlightened many social science researchers, prompting them to look at the different realms of influence that any social phenomenon could be subjected to.

Chai et al., (2014) articulate four levels of context as Ministry of Education, Education Technology Division (the office within the Ministry in charge of education technology), schools and classrooms. The framework allows the study to recognize important insights into ICT integration such as highlighting the problems of contradictory relationships between the activity systems that are pegged at different levels. Their research also recognises the different levels at play, i.e., the macro-level (the Ministry), the exo-level (the Division), the meso-level (the school, consisting of the different classrooms), and the micro-level (the classroom). Putting the ‘‘contexts’’ of actor and scope together, they propose that research on TPACK, and thus on ICT integration, can be conceptualized at five levels as depicted in Figure 2.1. This expanded TPACK framework argues that TPACK creation is a multilevel context with actors of different designations.

Figure 2. 1: Multi-level contextual TPACK framework (Adapted from Chai et al., 2014)



However, educators are not usually the decision makers beyond the micro-level. There is therefore a need to consider the other levels and the major decision makers' perspectives within each level, rather than confining the perspective to the teachers alone. The meso-level concerns the relationships and patterns in the environments in which the teacher is involved, such as the classroom and the teacher's home or two or more classrooms (i.e., the school). Thus, the educators at this level could be the principals and heads of department. The exo-level refers to the teacher's immediate environment, and another environment that the teacher is not directly linked to such as the student's home, industry partners, research institutes, and educational bodies.

Thus, at the exo-level, parents, software designers, researchers, and even ministry officers are the co-actors (Chai et al., 2014; Matwadia,2018).

The macro-level includes the societal norms, the national policies, etc. Educators at this level include policy makers as well as media personnel. Lastly, the chrono-level examines the change in the teacher over time, and also the change in the classroom environment. In essence, all the afore-mentioned educators are involved in this level as they collectively change and influence with time (Chai et al., 2014; Matwadia, 2018).

Therefore, the expanded TPACK framework argument is that design thinking should not rest solely on the teachers' shoulder but on all designations of educators. That is, all educators can design and create TPACK. This enables a collective effort to design and re-culture the education system and create the emergence of a new culture of learning (Chai et al., 2014; Matwadia, 2018).

The proposed theoretical framework described in Figure 1, allows the study to generate a comprehensive research agenda to study and document the totality of "successful" and "unsuccessful" integration of M-learning in the classrooms. Such a study will inform policymakers, school administrators and teachers about how to take up the opportunities and address the limitations of digital media in the classroom, and how to successfully integrate digital media in schools, specifically within their broader sociocultural contexts.

2.8.5 Summary

Even though the purpose and focus need to be clear and precise for the purpose of effective academic discourse, the constructs under discussion are therefore considered in the light of this broader meta-approach to the use of mobile phones in the classroom. It acknowledges the wider context and the interdependence of contextual systems.

This study acknowledges the different role players in the education system and the how these role players will assist in managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

2.9 CONCLUSION

This chapter presents a literature review for the study as it reviews relevant literature on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. International and local literature centring on the concept of nomophobia and the theories of addiction were examined. This chapter went on to explore teaching and learning theories and the determinants of the quality of teaching and learning, that are relevant to the study. Furthermore, this chapter addresses M-learning and how it should be implemented in the classroom to alleviate the impact of nomophobia and also looked at existing frameworks for managing the use of mobile phones in the classroom. This study purports to present empirical data on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

The relevance of the literature study was also indicated by virtue of the ubiquitous use of mobile phones in all aspects of life. The discussion indicated the need for teachers and learners to employ M-learning in pedagogical practices in order to gain and share knowledge with their peers, to improve their teaching strategies to enable their learners to achieve the 21st century learning skills. The harmful effects of nomophobia were highlighted to emphasise the negative effects it may have on the quality of teaching and learning in Gauteng schools.

The next chapter will provide a theoretical framework for the study and all aspects with regard to the chosen framework.

CHAPTER THREE
THEORETICAL FRAMEWORK FOR THE STUDY

3.1 INTRODUCTION

This chapter provides a theoretical framework for the study and all aspects with regard to the chosen framework. A subject as expansive as the impact of nomophobia on the quality of teaching and learning is best viewed from a multi-dimensional perspective. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists. The researcher will use the relevant theories to formulate, explain, predict, and understand phenomena and, in many cases to challenge and extend existing knowledge within the limits of critical bounding assumptions (Swanson, 2013). Since they were found applicable to this study, the theoretical framework chosen for this study is The Network Society Theory. These descriptions will assist in exploring and managing the impact of nomophobia on the quality of teaching and learning.

The ubiquitous nature of mobile phones in knowledge creation, sharing and distribution has led to the development of connecting via technology. Studies such as those by Lim (2016) and Mukhari (2016) indicate that the various pedagogies can be used with relevant mobile phone tools to achieve the intended goals and the 21st century teaching and learning skills. The discussion will address teaching and learning with mobile phones and how the misuse of mobile phones can lead to addictions.

3.2 WHAT IS A THEORETICAL FRAMEWORK?

The term “theoretical framework” comprises two words, ‘theory’ and ‘framework’. It is therefore appropriate to start by giving definitions of what a theory is and what a framework is. A theory, according to Kerlinger (1986:9), is *“a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting phenomena”*, while a theory, according to Kiwunja (2018, p 45) is a , *”generalised statement of abstractions or ideas that asserts, explains or predicts relationships or*

connections between or among phenomena, within the limits of critical bounding assumptions that the theory explicitly makes". Kawulich (2009) highlights that while theory can be used to frame and understand phenomena, it cannot be understood as an infallible law independent from space and time, coming before everything else. Theory in research is a helpful tool to interpret reality, not something reality must conform to. Theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions (Swanson, 2013).

A theory usually emerges from a long process of research that uses empirical data to make assertions based on deductive and inductive analysis of the data (Kivunja, 2018). Over time, and on the basis of clearly stated assumptions, the observations from the research produce results that converge on findings about relationships, and these enable the researcher to formulate the core propositions from which the abstract theory is then generalised (Kawulich, 2009; Glanz, 2017). The theory that emerges provides an intellectual, research-grounded basis for understanding, applying, analysing, and designing new ways to investigate relationships and to solve problems in educational and social sciences contexts. The assumptions, assertions, and predictions of relationships postulated by a theory become an intellectual base upon which research data can be grounded to search for meaning in future studies.

The predictions in the theory can provide reason for research into problems that hitherto have not been investigated. They help researchers to consider what is important and critical in understanding real-life situations, as postulated by the theory, and how our knowledge and understanding of contexts in education and the social sciences can be used to explain behaviour and to solve problems (Swanson, 2013; Glanz, 2017). As explained by Jacard and Jacob (2010), each theory – its assumptions, tenets, assertions, propositions, predictions – comprises a common frame of reference that can be used by researchers in a particular discipline as to what is understood to be true or a basis for searching for meaning and truth in our lived experiences, and a well-grounded guide for research within the field. This is well articulated by Glanz, (2017, p. 10). *"Theory, research, and practice are part of a continuum for understanding the determinants of behaviours, testing strategies for change, and disseminating effective*

interventions". The three are inextricably interlinked. Theory enables researchers to name what they observe, to understand and to explain relationships and to make sense of human interactions. This understanding increases the body of knowledge in the field and provides a basis for further theorisation, research, and understanding.

A framework is *"is a particular set of rules, ideas, or beliefs which you use in order to deal with problems or to decide what to do."* (Collins, 2021). According to Kerlinger (1986), a theory can be used to successfully make predictions and this predictive power of the theory can help guide researchers to ask appropriate research questions. On the other hand, a framework provides structure within which the relationships between variables of a phenomenon are explained.

Abd-El-Khalick and Akerson (2007) point out the difficulty of identifying an exact definition of a theoretical framework in the field of (science) education. Nevertheless, LeCompte and Preissle (1993) define a theoretical framework as a collection of interrelated concepts that can be used to direct research with the purpose of predicting and explaining the results of the research. Simply put, a theoretical framework is used to provide the rationale for conducting the research (Caliendo & Kyle, 1996; Radhakrishna, Yoder & Ewing, 2007). In educational research, theoretical frameworks have a number of advantages, which improve the quality of research (Caliendo & Kyle, 1996).

Theoretical frameworks can strengthen a study in the following ways (Caliendo & Kyle, 1996; Abd El Khalick & Akerson, 2007; Swanson, 2013):

- An explicit statement of theoretical assumptions permits the reader to evaluate them critically.
- The theoretical framework connects the researcher to existing knowledge. Guided by a relevant theory, the researcher is given a basis for his/her hypotheses and choice of research methods.
- Articulating the theoretical assumptions of a research study forces the researcher to address questions of why and how. It permits him/her to intellectually transition from simply describing the phenomena observed to generalizing about various aspects of that phenomenon.

- Having a theory helps the researcher to identify the limits to those generalizations. A theoretical framework specifies which key variables influence a phenomenon of interest and highlights the need to examine how those key variables might differ and under what circumstances.
- Basing research on a theoretical framework is important, as research is theory driven.

Sinclair (2007) as well as Fulton and Krainovich-Miller (2010) compare the role of the theoretical framework to that of a map or travel plan. Thus, when travelling to a particular location, the map guides your path. Likewise, the theoretical framework guides the researcher so that s/he would not deviate from the confines of the accepted theories to make his/her final contribution scholarly and academic. Thus, Brondizio, Leemans and Solecki (2014) concur that the theoretical framework is the specific theory or theories about aspects of human endeavour that can be useful to the study of events. The theoretical framework consists of theoretical principles, constructs, concepts, and tenants of a theory (Grant & Osanloo, 2014; Adom et al., 2018).

The theoretical framework for a research proposal or thesis is not a summary of the researchers' own thoughts about his/her research. Rather, it is a synthesis of the thoughts of giants in the field of research, as they relate to the researchers' proposed research or thesis, as the researcher understands those theories, and how he/she will use those theories to understand the data (Adom et al., 2018). In essence, the theoretical framework comprises what leaders in the field of research say about the research question, about the problem planned to investigate, and might even include suggestions of how to solve that problem, including how to interpret the findings in the data. What those leaders say, helps to develop an informed, and specialized lens, through which the data is examined, conduct the data analysis, interpret the findings, discuss them, and even make recommendations, and conclusions (Kivunja, 2018).

On the contrary, a conceptual framework is the total, logical orientation and associations of anything and everything that forms the underlying thinking, structures, plans and practices and implementation of the entire research project (Adom et al,.2018; Kivunja, 2018). So, the conceptual framework comprises the researchers'

thoughts on identification of the research topic, the problem to be investigated, the questions to be asked, the literature to be reviewed, the theories to be applied, the methodology that will be used, the methods, procedures and instruments, the data analysis and interpretation of findings, recommendations and conclusions that will be made (Ravitch & Riggan, 2017). Thus, the conceptual framework is the logical conceptualization of the entire research project. Saying that it is a logical conceptualization means that a conceptual framework is a metacognitive, reflective and operational element of the entire research process (Kivunja, 2018).

The conceptual framework can be viewed as the logical master plan for the entire research project (Caliendo & Kyle, 1996; Adom et al., 2018). It is noteworthy, as can be seen from the above, that a theoretical framework is only a little sub-set of the conceptual framework. A helpful analogy might be, that while the conceptual framework is the house, the theoretical framework is but a room that serves a particular purpose in that house. The purpose of the room could, for example, be the kitchen, or living room, or bathroom or bedroom, or garage. While each room has a unique purpose, no single room can serve all the functions that a house serves. This analogy should help to appreciate better, why these two terms should never be used interchangeably. Only in a one-room 'house', would the house and room be one and the same thing. Most houses are not built like that (Kivunja, 2018).

The conceptual framework is thus the umbrella term relating to all the concepts and ideas that occupy your mind as you contemplate, plan, implement and conclude your research project. Thus, whereas the conceptual framework could be the product of the researchers' own thinking about his/her research study, the theoretical framework comprises other people's theoretical perspectives that are interpreted as relevant to the research, and in particular, helpful in data analysis and interpretation (Kivunja, 2018). The researcher has chosen a theoretical framework since it consists of concepts, together with their definitions, and existing theories that are relevant to this particular study. The theoretical framework will demonstrate an understanding of theories and concepts that are relevant to managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools and will relate it to the broader fields of knowledge related to this study.

The theories of teaching and learning and the theories of addiction have been dealt with in Chapter 2 as they contribute to the foundation of the literature study developed in Chapter 2. This Chapter will concentrate on The Network Society Theory that reflects the foundation upon which the research is constructed.

3.3 THE NETWORK SOCIETY THEORY AS A FRAMEWORK FOR THIS STUDY

The theoretical framework underpinning the study is the Network Society Theory which emphasises the significant role played by the new technologies of information and communication and the formation of connections for the creation and distribution of knowledge in The Network Society. Castells (2004) and Anderson (2014) maintain that participants in The Network Society use communication, computer networks and the Internet to create and acquire, share and disseminate information in order to become knowledgeable human beings and to make the world they live in a better place. The Network Society Theory will enhance the understanding of the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

The concept of The Network Society is closely associated with interpretation of the social implications of globalisation and the role of electronic communications technologies in society. The definition of The Network Society given by the foremost theorist of the concept, Manuel Castells (2011b, p. 3) is that it is *"a society whose social structure is made up of networks powered by micro-electronics-based information and communications technologies."* People always want to communicate with other people. People used to just visit the people they wanted to see (Samur, 2018). The longer the distance, the harder it was to communicate. Throughout history, people came up with various ways of communicating: through post, pigeons, telegraph, light signals and telephone. Getting responses a few hundred years ago meant waiting for months or a year. Thankfully, humans never stopped looking for a faster method to communication. The 20th century brought us the Internet. Social networking was born one day in 1971, when the first email was sent. The two computers were sitting right next to each other. The message said "qwertyuiop' (Castells, 2011b). As Castells shows in his book, historically, there have always been social networks: the key factor that distinguishes

The Network Society is that the use of ICTs helps to create and sustain far-flung networks in which new kinds of social relationships are created.

According to Castells (2011b), three processes led to the emergence of The Network Society in the late 20th century:

- the restructuring of industrial economies to accommodate an open market approach.
- the freedom-oriented cultural movements of the late 1960s and early 1970s, including the civil rights movement, the feminist movement and the environmental movement and
- the revolution in information and communication technologies.

Castells' (2011) analysis of the significance of these three processes provides a broad historical context for the development paradigms of The Network Society Theory. The significance of economic restructuring is that it created the conditions for the emergence of the open market development paradigm, weakening the nation state and deepening processes of social inclusion and exclusion between and within countries. The cultural movements were significant because they created the conditions for emergence of an opposing 'human-capabilities centred' development paradigm that focuses on human rights. The values of individual autonomy and freedom espoused by this cultural change shaped the open network structure for communication. As Castells concludes, *"the culture of freedom was decisive in inducing network technologies which, in turn, were the essential infrastructure for business to operate its restructuring in terms of globalisation"* (Castells, 2011b, p. 22).

Kenton and Mansa (2021) describe The Network Society as the use of Internet-based social media sites to stay connected with friends, family, colleagues, customers, or clients. Social networking can have a social purpose, a business purpose, or both, through sites like Facebook, Twitter, LinkedIn, and Instagram. The Network Society has become a significant base for marketers seeking to engage customers. The Network Society involves the development and maintenance of personal and business relationships using technology. This is done through the use of social networking sites, such as Facebook, Instagram, and Twitter. These sites allow people and corporations

to connect with one another so they can develop relationships and so they can share information, ideas, and messages. Family members who are far apart may remain connected through personal social networking sites like Facebook. They can share photos and updates on things that are going on in their lives (Kenton & Mansa, 2021). People can also connect with others (notably, strangers) who share the same interests. Individuals can find each other through groups, lists, and the use of hashtags. Social networking is commonly used by marketers so they can increase brand recognition and encouraging brand loyalty. Since it makes a company more accessible to new customers and more recognizable for existing customers, social media marketing helps promote a brand's voice and content.

The Network Society is a social structure based on networks operated by information and communication technologies based on microelectronics and digital computer networks that generate, process and distribute information via the nodes of the networks (Castells, 2011b). The Network Society can be defined as a social formation with an infrastructure of social and media networks enabling its prime mode of organization at all levels (individual, group, organizational and societal). Increasingly, these networks link all units or parts of this formation. In western societies, the individual linked by networks is becoming the basic unit of the network society. In eastern societies, this might still be the group (family, community, work team) linked by networks (Kirtiklis, 2017).

In the contemporary process of individualisation, the basic unit of the network society has become the individual who is linked by networks. This is caused by simultaneous scale extension (nationalisation and internationalisation) and scale reduction (smaller living and working environments) (Barney, 2004; Kirtiklis, 2017). Other kinds of communities arise. Daily living and working environments are getting smaller and more heterogenous, while the range of the division of labour, interpersonal communications and mass media extends. So, the scale of The Network Society is both extended and reduced as compared to the mass society. The scope of The Network Society is both global and local, sometimes indicated as 'glocal'. The organization of its components (individuals, groups, organizations) is no longer tied to particular times and places. Aided by information and communication technology, these coordinates of existence

can be transcended to create virtual times and places and to simultaneously act, perceive and think in global and local terms (Hassan, 2004; Kirtiklis, 2017).

A network can be defined as a collection of links between elements of a unit. The elements are called nodes, units are often called systems. The smallest number of elements is three and the smallest number of links is two. A single link of two elements is called a relationship (Castells, 2011a; Anttiroiko, 2015). Networks are a mode of organization of complex systems in nature and society. They are relatively complicated ways of organizing matter and living systems. So, networks occur both in complicated matter and in living systems at all levels. Networks are selective according to their specific programs because they can simultaneously communicate and in-communicate. The Network Society diffuses in the entire world but does not include all people. In fact, in this early 21st century, it excludes most of humankind, although all of humankind is affected by its logic and by the power relationships that interact in the global networks of social organization (Anttiroiko, 2015).

Networks are not new. What is new is the microelectronics-based, networking technologies that provide new capabilities to an old form of social organization networks (Hassan, 2004; Castells, 2011; Antiroiko, 2015). Networks throughout history had a major problem vis-a-vis other forms of social organization. Thus, in the historical record, networks were the domains of the private life. Digital networking technologies enable networks to overcome their historical limits. They can, at the same time, be flexible and adaptive thanks to their capacity to decentralize performance along a network of autonomous components, while still being able to coordinate all this decentralized activity on a shared purpose of decision making (Castells, 2011b). Networks are not determined by the industrial technologies but unthinkable without these technologies. In the early years of the 21st century, The Network Society is not the emerging social structure of the Information Age: it already configures the nucleus of our societies (Van Dijk, 2020).

Van Dijk (2020) has defined the idea of a *'Network Society'* as a form of society that is increasingly organizing its relationships in media networks, gradually replacing or complementing the social networks of face-to-face communication. Personal and

social-network communication is supported by digital technology. Van Dijk also warns that this abstract, yet barely visible reality, is making humans dependant on computer networks such as the Internet.

The use of mobile phones in The Network Society is also important to induce the culture of virtual reality which stimulates creative thinking by allowing problem solution in ways not usually possible (Castells, 2011b). In a pedagogical situation, virtual reality technologies are used in authentic learning where learners experience phenomena that are impossible to explore in the traditional classroom. This theoretical framework requires teachers to use mobile phones in their teaching tasks in order to produce learners equipped with 21st century skills that will be required for future jobs and for the economic growth of the country.

The Network Society Theory is relevant to this study because the effective use of network platforms results in the professional development of teachers who have to engage in digital literacy and lifelong learning in order to produce self-motivated and self-directed learners. According to Levinsen (2011), these are learners who engage in constructive learning processes and are expected to encounter new things, ask questions, figure out the unknown and find it natural to network and share knowledge. As present-day learners are digital natives, South African learners are also viewed as such. Research indicates that many teenagers in Gauteng province are addicted to cell phones and use them to access the Internet, to download music, build their relationships and boost their self-esteem (Unisa, 2012). Other findings indicate that many South African learners especially in the high schools and institutions of higher learning use mobile technology for communication with their fellow learners and teachers (Mayisela, 2013). Consequently, South African teachers have to be able to adapt to new conditions and challenges and employ the use of mobile phones to facilitate learning activities that will produce self-initiated learners equipped with the constructivist competencies required in The Network Society to be globally competitive.

The researcher chose The Network Society Theory on the basis that today's teachers and learners are part of The Network Society which is using mobile phones in all spheres of life. Secondly, South Africa has a shortage of adequately trained teachers

in urban and rural schools. Therefore, mobile phones, in the researcher's view, can be seen as a solution for the professional development of teachers and to equip them with the knowledge they require to be able to teach their learners. However, the addiction of teachers and learners to their respective mobile phones can prove to be a challenge to the quality of teaching and learning. This study purports to present some empirical data on the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms.

3.4 HISTORICAL DEVELOPMENTS IN THE NETWORK SOCIETY THEORY

3.4.1 Introduction

The Network Society is the expression coined in 1991 related to the social, political, economic and cultural changes caused by the spread of networked, digital information and communications technologies (Castells, 2004; Van Dijk, 2020). The intellectual origins of the idea can be traced back to the work of early social theorists such as Georg Simmel who analysed the effect of modernization and industrial capitalism on complex patterns of affiliation, organization, production and experience (Watier, 2020).

3.4.2 Former Network Society 'gurus'

3.4.2.1 Introduction

It is important to introduce the different scholars that contributed to this fruitful exchange of ideas and analysis and provide guidelines for enacting policies in The Network Society. In this context, the clear formulation of strategic guidelines and, above all, making decisions at the right time and on the basis of knowledge of the current economic and social trends at the time of the scholar's research, are absolutely crucial for stimulating and monitoring the necessary changes to The Network Society Theory. An expose of the scholars that have made significant contributions to The Network Society Theory follows.

3.4.2.2 Wellman, Hiltz and Turoff and The Network Society

Craven and Wellman studied The Network Society as sociologists at the University of Toronto. Their first formal work was in 1973, '*The Network City'* (Craven & Wellman, 1973), with a more comprehensive theoretical statement in 1988. Wellman has argued that societies at any scale are best seen as networks and *"networks of networks"* (Wellman, 2001, p 228) rather than as bounded groups in hierarchical structures (Craven & Wellman, 1973; Wellman, 1979; Wellman, 1988). More recently, Wellman has contributed to the theory of social network analysis with an emphasis on individualized networks, also known as networked individualism (Wellman, 2001). In his studies, Wellman focuses on three main points of the Network Society: community, work and organizations. He states that with recent technological advances an individual's community can be socially and spatially diversified. Organizations can also benefit from the expansion of networks in that having ties with members of different organizations can help with specific issues.

Hiltz and Turoff's (1978) publication, '*The Network Nation,'* explicitly built on Wellman's community analysis, taking the publication's title from Craven and Wellman's (1973) '*The Network City'*. The book argued that computer supported communication could transform society. It was remarkably prescient, as it was written well before the advent of the Internet.

3.4.2.3 Castells and the Network Society

According to Castells (2011b), networks constitute the new social morphology of our societies. Castell's definition of The Network Society is a society where the key social structures and activities are organized around electronically processed information networks. So, it's not just about networks or social networks, because social networks have been very old forms of social organization. It's about social networks which process and manage information and are using micro-electronic based technologies. The diffusion of a networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture (Harengel & Haxhixhemajli, 2011). For Castells, networks have become the basic units of modern society.

The Network Society goes further than the information society that is often proclaimed. Castells argues that it is not purely the technology that defines modern societies, but also cultural, economic and political factors that make up The Network Society. Influences such as religion, cultural upbringing, political organizations, and social status all shape The Network Society. Societies are shaped by these factors in many ways. These influences can either raise or hinder these societies. Information forms the substance of contemporary societies, while networks shape the organizational forms and (infra)structures of these societies (Castells, 2011b; Mukhari,2016).

3.4.2.4 Van Dijk and the Network Society

The term *Network Society* was coined by Van Dijk (2020) in his publication *De Netwerkmaatschappij* (*The Network Society*) and by Manuel Castells in *The Rise of the Network Society* (2011b), the first part of his trilogy *The Information Age*. Martin used the related term *'The Wired Society'* indicating a society that is connected by mass- and telecommunication networks (Martin, 1978; Mukhari, 2016).

Van Dijk (2020) defines the Network Society as a society in which a combination of social and media networks shapes its prime mode of organization and most important structures at all levels (individual, organizational and societal). He compares this type of society to a mass society that is shaped by groups, organizations and communities (masses) organized in physical co-presence. Van Dijk has defined the concept of a *'Network Society'* as a form of society increasingly organizing its relationships in media networks gradually replacing or complementing the social networks of face-to-face communication. Personal and social-network communication is supported by digital technology. This means that social and media networks are shaping the prime mode of organizations and most important structures of modern society (Mukhari, 2016).

Van Dijk's (2020) '*The Network Society'* describes what the Network Society is and what it might be like in the future. The first conclusion of this book is that modern society is in a process of becoming a Network Society. This means that on the Internet interpersonal, organizational, and mass communication come together. People become linked to one another and have access to information and communication with one another constantly. Using the Internet brings the *'whole world'* into homes and

workplaces. Also, when media like the Internet becomes even more advanced it will gradually appear as *'normal media'* in the first decade of the 21st century as it becomes used by larger sections of the population and by vested interests in the economy, politics and culture. It asserts that paper means of communication will become out of date, with newspapers and letters becoming ancient forms for spreading information.

3.4.2.5 Summary

Our world has been in a process of structural transformation for over two decades. This process is multidimensional, but it is associated with the emergence of a new technological paradigm, based in information and communication technologies, that took shape in the 1970s and diffused unevenly around the world. We know that technology does not determine society: it is society. Society shapes technology according to the needs, values, and interests of people who use the technology. The contributions of the scholars to The Network Society Theory will enhance the understanding of managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

3.5 MODERN EXAMPLES OF NETWORK SOCIETIES

The concepts described above by The Network Society 'gurus' such as Van Dijk, Wellman, Hiltz and Turoff, and Castells are embodied in the use of digital technology. Social networking sites such as Facebook and Twitter, instant messaging and email are prime examples of the Network Society at work. These web services allow people all over the world to communicate through digital means without face-to-face contact (Niemandt, 2013). This demonstrates how the ideas of a changing society will affect the persons we communicate with over time.

The Network Society does not have any confinements and has found its way to the global scale (Castells, 2011b). The Network Society is developed in modern society that allows for a great deal of information to be traded to help improve information and communication technologies (Van Dijk, 2020). Having this luxury of easier communication also has consequences. This allows for globalization to take place. Having more and more people joining the online society and learning about different

techniques with the world wide web. This benefits users who have access to the Internet, to stay connected all the time with any topic that the user wants to research. (Niemandt, 2013). Individuals without Internet may be affected because they are not directly connected into this society. People always have an option to find public space with computers with Internet. This allows a user to keep up with the ever-changing system. The Network Society is constantly changing the cultural production in a hyper-connected world (Hassan, 2004). Social structures revolve around the relationship of the production/consumption, power, and experience (Castells, 2011b). These conclusively create a culture, which continues to sustain by getting new information constantly.

Our society system was a mass media system where it was a more general place for information. Now the system is more individualized and custom-made system for users making the Internet more personal. This makes messages to the audience more inclusive sent into society. Ultimately allowing more sources to be included for better communication.

The Network Society is seen as a global system that helps with globalization (Niemandt, 2013). This is beneficial to the people who have access to the Internet to get this media. The negative aspect to this is that people without access to digital technology do not get this sense of The Network Society. These networks, that have now been digitized, are more efficient in connecting people. Everything we know now can be put into a computer and processed. Users put messages online for others to read and learn about topics of interest. This allows people to gain knowledge faster and more efficiently. The Network Society allows for people to connect to each other quicker and to engage more actively. These networks go away from having a central theme, but still have a focus in what there is to accomplish (Hassan, 2004).

3.6 THE NETWORK SOCIETY AND IT'S INTERACTION WITH NEW MEDIA

New media is the concept that new methods of communicating in the digital world allow smaller groups of people to congregate online and share, sell and swap goods and information. It also allows more people to have a voice in their community and in the world in general (Flew, 2008). The most important structural characteristic of new

media is the integration of telecommunications technologies. The second structural new media characteristic of the current communications revolution is the rise of interactive media. Interactivity is a sequence of action and reaction. The downloaded link or the supply side of web sites, interactive television and computer programs is much wider than the uplink or retrieval made by their users (Niemandt, 2013). The third, technical, characteristic of new media is digital code. The new media are defined by all three characteristics simultaneously: *"they are media which are both integrated and interactive and also use digital code at the turn of the 20th and 21st centuries."* (Castells, 2011a, p 356)

There is an explosion of horizontal networks of communication, quite independent from media business and governments, that allows the emergence of what can be called self-directed mass communication (Hassan, 2004; Niemandt, 2013). It is mass communication because it is diffused throughout the Internet, so it potentially reaches the whole planet. It is self-directed because it is often initiated by individuals or groups by themselves bypassing the media system. The explosion of blogs, vlogs, podding, streaming and other forms of interactive, computer to computer communication set up a new system of global, horizontal communication networks that, for the first time in history, allow people to communicate with each other without going through the channels set up by the institutions of society for socialized communication (Siapera, 2017).

3.7 THE NETWORK SOCIETY AND SOCIAL COMMUNICATION

The Network Society constitutes socialized communication beyond the mass media system that characterized the industrial society (Castells, 2011a; Antirroiko, 2015). It does not represent the world of freedom sung by the libertarian ideology of Internet prophets. It is made up both of an oligopolistic business multimedia system controlling an increasingly inclusive hypertext, and of an explosion of horizontal networks of autonomous local/global communication-and, naturally, of the interaction between the two systems in a complex pattern of connections and disconnections in different contexts (Antirroiko, 2015). The Network Society is also manifested in the transformation of sociability. Yet, what we observe is not the fading away of face-to-

face interaction or the increasing isolation of people in front of their computers. We know from studies in different societies (Anderson, 2014; Antirroiko, 2015), that in most instances Internet users are more social, have more friends and contacts and are more socially and politically active than non-users. Moreover, the more they use the Internet, the more they also engage in face to-face interaction in all domains of their lives. Similarly, new forms of wireless communication, from mobile phone voice communication to SMSs, Wi-Fi and WiMAX, substantially increase sociability, particularly for the younger groups of the population. The Network Society is a hyper social society, not a society of isolation.

People, by and large, do not face their identity on the Internet, except for some teenagers experimenting with their lives (Hassan, 2004; Antirroiko, 2015). People fold the technology into their lives, link up virtual reality and real virtuality; they live in various technological forms of communication, articulating them as they need it. However, there is a major change in sociability, not a consequence of Internet or new communication technologies but a change that is fully supported by the logic embedded in the communication networks. This is the emergence of networked individualism, as social structure and historical evolution induce the emergence of individualism as the dominant culture of our societies, and the new communication technologies perfectly fit into the mode of building sociability along self-selected communication networks, on or off depending on the needs and moods of each individual. So, The Network Society is a society of networked individuals (Castells, 2011b; Kirtiklis, 2017).

What results from this evolution is that the culture of The Network Society is largely shaped by the messages exchanged in the composite electronic hypertext made by the technologically linked networks of different communication modes (Castells, 2011b; Anderson, 2014). In the Network Society, virtuality is the foundation of reality through the new forms of socialized communication. Society shapes technology according to the needs, values and interests of people who use the technology. Furthermore, information and communication technologies are particularly sensitive to the effects of social uses on technology itself. The history of the Internet provides ample evidence that the users, particularly the first thousands of users, were, to a large extent, the producers of the technology. However, technology is a necessary, albeit not sufficient

condition for the emergence of a new form of social organization based on networking, that is on the diffusion of networking in all realms of activity on the basis of digital communication networks (Castells, 2011b).

3.8 NETWORK SOCIETIES IN THE WORK ENVIRONMENT

3.8.1 Introduction

The first question we seek to address is “What is networking?” A primary weakness of the fragmented networking literature is the lack of a consensus definition. Throughout the history of its study, networking has been operationalized in a variety of idiosyncratic ways. For example, some scholars view networking behaviours that focus on the goal of building relationships that will help individuals advance in their careers (Forret & Dougherty, 2004; Gibson, Hardy & Buckley, 2013) whereas others propose that the definition of networking should be limited to those outside of one’s direct chain of command (Orpen, 1996). These differences in definition have important implications for how networking is conceptualized, related to other constructs, and measured.

Furthermore, the lack of a unified definition limits the potential for developing a comprehensive understanding of networking as a behavioural phenomenon. Gould and Penley (1984) provided one of the first empirical definitions of networking where they described networking as “*the practice of developing a system or ‘network’ of contacts inside and/or outside the organization, thereby provided relevant career information and support for the individual*” (p. 246). However, by defining networking as the development of networks, this definition contained a tautology and was thus limited in its usefulness.

Michael and Yukl (1993) took a more interpersonal perspective by defining networking behaviours as, “*behaviours designed to build informal interpersonal relationships with people inside and outside the organization. In general, networking involves the exchange of affect (liking, friendship), information, benefits, and influence*” (p. 328). The authors elaborated that many behaviours can be used to build and maintain networks, including calling and visiting people, socializing before and after formal events,

attending social activities, doing favours, mentoring, informal conversations, or passing on gossip.

In contrast, Orpen (1996) believed networking is primarily utilitarian in focus and should refer primarily to external connections. Accordingly, he defined networking as "*the process of building up and maintaining a set of informal, cooperative relationships with persons other than the manager's immediate superior and subordinates in the expectation that such relationships will help or assist the manager to perform his or her job better*" (p. 245).

Forret and Dougherty (2004) defined networking as a tool for career development. Specifically, they conceptualized networking as "individuals' attempts to develop and maintain relationships with others who have the potential to assist them in their work or career" (p. 420). Similarly, Wolff and Moser (2009) defined networking as *"behaviours that are aimed at building, maintaining, and using informal relationships that possess the (potential) benefit of facilitating work related activities of individual by voluntarily granting access to resources and maximizing common advantages*" (p. 196). What can be found among several definitions is that networking behaviours can be done both inside and outside of the networker's organization. Although previous research has suggested that internal networking may have more value than external networking (Wolff and Moser, 2009), the benefits of external networking may be better highlighted in competitive industries with greater mobility across jobs and organizations. Moreover, internal and external networking may ultimately predict different outcomes (Wolff and Moser, 2009).

Networking is driven by an ultimate purpose or goal. However, the explicit goal of networking is not consistent across definitions, sometimes referring to assisting in work or career, exchange of information, benefits, and influence, or access to resources and jointly maximizing advantages of the individuals involved. In other definitions purpose and intention are not specified. Nevertheless, the researcher believes that it is important to recognize that networking is goal-directed behaviour in order to differentiate it from more casual social interactions (Gibson, Hardy & Buckley, 2014). Examples of networking behaviour include (but are not limited to) the following

behaviours: inviting an influential colleague to a social or work function, contacting an expert in order to gain knowledge needed to complete an assignment, requesting assistance from a contact when seeking a promotion or raise, interacting with a professional colleague in a social context with the intent of developing a deeper relationship, and taking a new co-worker out for a drink to help them integrate into the organization (Dittes & Smolnik, 2019).

Social networks are defined as nodes of individuals, groups, organizations, and systems that are related by one or more interdependencies, potentially including visions, values, ideas, social contacts, and joint memberships, among others (Serrat, 2010). Although, social networks and networking are fairly similar at the surface level, social networks and networking have different foci. Social network analysis – the methodological approach typically used to study social networks – is concerned with the structure and pattern of network relationships and the types of exchanges that occur in said networks (Scott, 2012). This includes the mapping and measuring of the relationships among people, groups, and organizations. Researchers using social network analysis are interested in the networks people form, but not in what these networks mean in terms of predictors of network size and intensity, or the personal and organizational outcomes that may come of these networks. Networking, on the other hand, focusses on the behaviours people use to build and maintain networks. Although the two issues both relate to networks, their purpose and reason for study are quite distinct (Serrat, 2010; Scott, 2012). Accordingly, the researcher argues that social networks and networking are separate and relatively independent constructs and should be treated as such.

Scientific and technological progress moves ahead rapidly and makes us think about how fast and how radically social reality will change. The modern economic activities are made of production, reproduction and exchange of information (Levinsen & Nielsen, 2010). That is why the labour market sets high requirements for special knowledge and higher education. With this, the modern production assumes the mandatory ability of an employee to *"create himself"* by obtaining skills that are taught nowhere but are of growing demand among the employers. This requires skills of teamwork under high risk and permanent uncertainty and an ability to solve non-standard tasks. Due to the

rampant development of science, technical knowledge is depreciating very fast. Consequently, resources of secondary and higher education allow only getting the basic knowledge, which every individual has to increase during his/her entire career (Dobrinskaya, Kurbanov & Vershinina, 2017).

Schwab (2017) articulates that the future belongs to those ready to create and introduce innovative products and services. Owners of the traditional capital and those providing cheap labour will be forced out by automation. The basis of the modern enterprise is a complex of networks supporting instant conversion of signals into market products with the help of data processing. This assumes development of a new system of labour relations, including individualization of employment schemes. Demands of the new labour market testify that the existing educational systems are obsolete. Earlier a worker had to strictly follow the regulations and instructions, remember information, but nowadays such tasks can be implemented by machines. Researchers of the labour market forecast that in 20 years from 10 to 50% (according to various assessments) of the existing professions will disappear, and one third of the new ones will require skills unknown today (Dobrinskaya et al., 2017).

Social networking websites heavily influence organizational productivity outcomes in terms of effective collaboration across geographical and hierarchical work structures. The marketing of an organisation's products and collection of feedback responses from the marketplace are determined by the effectiveness of its websites. The effectiveness of an organisation's website also determines the visibility of an organisation in the increasingly crowded world of online commerce (Awolusi, 2012; Dittes & Smolnik, 2019).

Both the enterprise and consumer social networking sites can be effectively used to an organization's benefit, but issues like corporate network security, bandwidth capacity, privacy, and costs associated with maintaining a social network need to be managed to minimize the risk/reward trade-offs associated with the use of a social networking site. Awolusi (2012) warns that an outright ban of the use of social network in the workplace would not only limit an organization's visibility in the online world but could also deprive it of the benefits that social networking provides when used as a

productivity tool in the workplace. The researcher feels that it is necessary to explore enterprise and social networking for the discourse of this study, highlighting managing the impact of nomophobia on the quality of teaching and learning.

3.8.2 Enterprise Social Networks

Enterprise social networks (ESN), also called corporate, private, or internal social networks, are those developed with the primary aim of promoting collaborations across hierarchical and geographical structures within an organization. These could be assets in times of a slumping economy and as the work force becomes geographically diverse with increasing travel costs (Swartz, 2008; Awolusi, 2012).

3.8.2.1 Benefits of Enterprise Social Networks

Enterprise social networking websites provide support for informal networks that are crucial to collaboration among employees with different skill sets in knowledge-intensive industries. This trend recognizes that effective collaboration mostly occurs through informal networks of relationships acquired by high-end knowledge workers rather than formal reporting hierarchy (Awolusi, 2012; Aboelmaged, 2018). Enterprise social networking sites promote a worker's visibility and make it possible for an open discussion without the encumbrances of office processes and formal communication channels.

One of the direct benefits of increased collaboration among workers, due to enterprise social networking sites, is the management of organizational-wide knowledge. For a learning organization, the management of knowledge and effective transfer of skills through knowledge sharing is a very desirable attribute. Collaboration at work results in the development of organizational citizenship behaviours, which is described as behaviours that are not limited exclusively to performing what is required by the role, but promoting discretionary and spontaneous behaviours, which in turn allows a continuous exchange among acquisition, experimentation, and transfer of knowledge (Kalra & Baral, 2020).

Enterprise social networking sites can be used to access and evaluate the impact of opinion leaders in a communication or information network in order to effectively manage information that is essential to organizational effectiveness. Opinion leaders can control the flow of formal and informal information inside and outside the workplace and often provide solutions to complex issues that are deemed satisfactory to most people. Domain-specific opinion leaders have been positively correlated to general opinion leadership and management could support these individuals with proper training and mentor positioning when seeking cost effective dissemination of knowledge to promote organizational effectiveness (Awolusi, 2012; Aboelmaged, 2018).

The visibility enjoyed by workers collaborating on enterprise social networking sites could also reduce the need to assert supervisory, or job-focused, impression management behaviours. Studies have found that being categorized as an out-group member in a formal or informal social network could enhance one's motivation to manage impressions in order to compensate for the out-group classification (Kalra & Baral, 2020). Enterprise social networking websites could be used as one of the tools to promote diversity and inclusion in an organization. It has been shown that the likelihood of communication and networking across informal groups increases with perceived similarities based on sex, race, or age (Swartz, 2008; Aboelmaged, 2018). Social networking sites would serve well as a medium for universal linkage between individuals working for an organization without regards to homophilous relationships. By default, enterprise social networks tend to have more rigorous requirements for security, authentication, and directory integration and could be paired with video conferencing, visual communications (Aboelmaged, 2018), and other productivity tools. Enterprise social networks could also provide a good alternative to corporate e-mails as an avenue to disseminate information and ideas.

3.8.2.2 Disadvantages of Enterprise Social Networks

Enterprise Social Networks could only be effective in organizations where a degree of trust exists between management and the work force. While guidelines would exist to guide behaviours and decorum on the networking website as an extension of the work

environment, management could discourage people from using it to communicate and collaborate if its contents are used in any aspect of performance evaluation or the reward system. There is also a risk that certain employees can use the enterprise social networking site excessively and waste time on things that are not related to work (Kalra & Baral, 2020). In addition, an upgrade of corporate bandwidth resources could be needed for enterprise social networking sites with video conferencing and other media features. This may come at a cost that could significantly increase the annual budget needed to keep and maintain such website.

3.8.3 Consumer Social Networks

Consumer social networks (CSN) are social networking websites that are open to the public. These include sites, such as Facebook, LinkedIn, Twitter, and Digg and may serve different purposes for different people (Awolusi, 2012).

3.8.3.1 Benefits of Consumer Social Networks

Consumer social networking websites could be used to complement an organization's online presence and will benefit search optimization on search engines through a synergetic effect called geometric extension (Awolusi, 2012). The geometric extension is the use of a single information asset to populate the various online networks operated by the company. An interview by a local TV company, for example, could be put on YouTube, shared on Twitter, posted on Facebook, and distributed across various micro-blogs operated by different departments of an organization. This will create free visibility on search engines about the news item and its contents, an advantage that would have had to be paid with advertisements on internet search engines.

Businesses spend a large amount of their annual budgets on market surveys and product promotion. Social networking websites not only allow businesses to market their products but also to engage their followers. The goal of the community-themed environment of consumer social networking websites is to provide a platform for an open and honest discussion (Aboelmaged, 2018). Thus, companies are able to gather feedback response cheaply and at a faster rate than conventional means (Kalra & Baral, 2020).

Corporations also like to participate in consumer social networking websites because it puts a human face on the business and allows people to get an impression of the business's relationships with its customers. In essence, it exposes a corporation to larger audiences (Awolusi, 2012; Aboelmaged, 2018). Moreover, there is growing evidence that opinion leaders on social networking sites affect the purchasing decisions of a significant number of social network enthusiasts. Social networking opinion leaders could be targeted with specific product advertisement or sample products where they gather online to maximize feedback response (Swartz, 2008).

Social recruiting is a trend that is newly associated with consumer social networking websites. According to Jobvite, an online social media service, up to 80% of companies used or planned to use social networking to find and attract candidates in 2018, with LinkedIn being used by 95% of the respondents and Facebook usage growing from 59% in 2009 to 79% in 2018 (Mochi, Bissola & Imperotari, 2019). The detailed personal information contained in consumer social networking sites will allow businesses to target the specific audience or skill sets they want for an open position.

Consumer social networking sites are now taking on the task of job training and re-training through the various academic and job-related educational videos promoted on their websites. YouTube EDU is an arm of the popular YouTube social networking website, and it promises an environment in which any qualified teacher can contribute and absolutely anyone can learn (Awolusi, 2012). YouTube EDU features lectures and materials from hundreds of colleges and universities, including Stanford, Harvard, and Massachusetts Institute of Technology (MIT). Similar social networking websites devoted to interactive learning include Academic Earth, Big Think, FORA.tv and iTunes. Many employees have been known to make use of these educational social networking sites to refresh their skills and gain knowledge in areas they wouldn't normally be exposed to at work, thereby driving productivity and effective transfer of training.

3.8.3.2 Disadvantages of Consumer Social Networks

A huge disincentive for organizations wishing to grant access to consumer social networking websites at work is the need to guarantee communications network security. Consumer social networks provide a huge amount of information, along with

a rich environment for those looking to breach an organization's communications security. Thus, intellectual property, inside secrets, and company procedures could be exposed to the public or competitors via consumer social networking websites or when employees download unapproved applications without recourse to the IT department (Kalra & Baral, 2020). Some companies generally avoid this by banning access to consumer social networks on company time (Awolusi, 2012). This may not always be a productive measure. A three-pronged approach, namely policy, education, and technology could help to reduce or eliminate internal network breach through consumer social networking websites (Aboelmaged, 2018). Research has also indicated that consumer social networks – particularly those that stream videos – use up a huge amount of corporate bandwidth, which is a real problem to businesses.

Consumer social networks create an avenue for a current or former employee to damage the reputation of a business through inappropriate photo links, rumours, or unauthorized business strategy updates online. Simon Heron, an internet security analyst, suggested that the sheer volume of traffic from corporate networks to social networking sites proved social networking sites are being used exceedingly for personal reasons and not strictly for business purposes (Awolusi, 2012; Kalra & Baral, 2020). Furthermore, businesses allowing the use of consumer social networking sites would need to tread carefully on issues surrounding privacy, as well as legalities involving anti-discrimination laws covered by both federal and state statutes. These issues could require additional labour resources to sufficiently address the problems, and it could negate the positive attributes of participating in a consumer social networking environment when considered together.

3.8.4 Conclusion

Network theories endorse the formation of network communities and platforms, and use mobile phones to acquire, share and distribute knowledge to everybody all over the world. Availability of knowledge to anyone, anywhere and at any time is confirmed by Selwyn (2012) with his notion of mobile phone development and the different routes that lead to different technological outcomes, and Levinsen and Nielsen (2010) who assert that communities are no longer limited to neighbourhoods because social

networks provide ways in which people can use these new ties to access resources. As indicated by Castells (2011a), these networks ensure the social inclusion of people into global networks for the accumulation and the flow of information. The same notion is referred to by Siemens (2008) who maintains that mobile phones in network forums are the means through which knowledge is distributed for addressing various, complex challenges.

Social networking websites are becoming an indispensable part of our larger society, with many businesses using them as tools to enhance a better relational experience with their employees and customers. A careful look at the various types of existing social networking sites suggests that businesses could choose to adopt either an enterprise social networking site or a consumer social networking site, or both, depending on the level of integration desired for matching organizational goals with marketing efforts, organizational learning, and public relations strategies. In this context, enterprise social networking sites are internal websites primarily developed to promote internal work collaborations while consumer social networking sites are available in the public domain and accessible to all. However, both types of social networking sites carry enormous benefits and some detriments that could hinder organizational productivity if not effectively managed (Awolusi, 2012).

3.9 NETWORK SOCIETY AND EDUCATION

The Network Society Theory is a social theory that focuses on social organisation and mobile phones and the role they play in transforming teaching and learning in the schooling system (Wildemeersch & Jütte, 2016). A social organisation is a pattern of relationships between and among individuals and social groups (Dreachslin, Gilbert & Malone, 2021). Characteristics of social organisation can include qualities such as sexual composition, spatiotemporal cohesion, leadership, structure, division of labour, communication systems, and so on (Wheelan, 2005). The characteristics of social organisation allow people to monitor their everyday work and involvement in other activities that are controlled forms of human interaction. These interactions include affiliation, collective resources, substitutability of individuals and recorded control.

These interactions come together to constitute common features in basic social units such as family, enterprises, clubs, states, etc. These are social organisations.

Social organisations may be seen online in terms of communities. The online communities show patterns of how people would react in social networking situations (Wildemeersch & Jutte, 2016). The technology allows people to use the constructed social organizations as a way to engage with one another without having to physically be in the same place. Looking at social organization online is a different way to think about it and a little challenging to connect the characteristics. While the characteristics of social organization are not completely the same for online organisations, they can be connected and talked about in a different context to make the cohesiveness between the two apparent. Online, there are various forms of communication and ways that people connect. Again, this allows them to talk and share common interests (which is what makes them a social organisation) and be a part of the organisation without having to physically be with the other members. Although online social organisation does not take place in person, they still function as social organisations because of the relationships within the group and the goal to keep the communities going (Zhang & Watts, 2008).

The advocates of the network society, such as Castells (2011a) maintain that the new social organisation originated towards the end of the 20th century as a result of the information technology revolution and the use of mobile phones in all spheres of life. The Network Society Theory emphasises the importance of knowledge and highly educated individuals if individuals, organisations and nations at large are to prosper. Based on the foundations of constructivism and network theory, connectivism was developed as the learning theory for the digital era. As the proponents of connectivism, Siemens (2004) and Downes (2008) highlight the necessity of learning through digital means and establishing connections to construct, critique and share knowledge which is one of the cornerstones of the knowledge society (Garcia, Brown & Elbeltagi, 2013). Another important facet of connectivism is aimed at supporting innovation and lifelong learning for all network members (Redecker, Ala-Mutka & Punie, 2010).

Networks can be helpful in engaging teachers in discussions with colleagues and empowering each other when facing challenges in the teaching and learning milieu. These interactions help in allaying the fears that most teachers have regarding the integration of mobile phones in teaching and learning. Castells' (2011a) Network Society Theory is of great importance to the use of mobile phones in education and the impact of nomophobia on the quality of teaching and learning in Gauteng schools and to this study in particular.

Levinsen and Nielsen (2010) highlight that the transition from the industrial to the networked society produces contradictions that challenges the educational system and force it to adapt to new conditions. These contradictions appear as a field of tension between time resources and the demand for educational quality. The size of curriculum is growing while the time available for learning is continuously decreasing. We teach for deep learning but are confronted by learners' cost-benefit strategies when they navigate through the study programme under time pressure.

Learning content will always be important but learning how to learn will be equally vital. This presents a challenge for teachers and for schools who will need to focus on two things simultaneously: teaching the content of subjects and helping learners to learn the ideas and practices associated with the process of learning itself. For many teachers, this requires them to learn new knowledge (about learning), develop new skills, and reassess their roles. Teachers need to learn, as well as their learners, and schools need to support them in this, which requires organisational learning. There is a sense, then, that learning how to learn is necessary for both learners and teachers (James & McCormick, 2009).

Levinsen and Nielsen (2010) state that due to the global need for competitiveness and economic growth, the corporate world is inclined to recruit a highly self-directed workforce and lifelong learners for jobs that are network related. This calls for the integration of digital resources and teaching-learning theories to produce creative, critical thinkers, problem solvers, collaborative workers and ICT skilled learners who will be able to perform the future jobs. The implication for the schooling system is that schools can no longer be responsible for the transmission of prescribed knowledge but

need to change and respond to the complexity of society, globalisation and the need for quality education (Mukhari, 2016). Schools are therefore required to employ mobile phones to improve and enhance teaching and learning.

The Network Society requires teachers to be lifelong learners and use ICT to enhance teaching skills and their professional development. Levinsen and Nielsen (2010) state that teachers in the 21st century must have the ability to retrain, adapt to new conditions and cope with change and challenges especially in their main task which requires them to produce digitally literate self-directed learners. This indicates that teachers must develop a positive attitude towards educational innovation and to the use of mobile phones in the schooling system. This requires them to understand the nature of their learners and the manner in which they learn.

The acceptance of mobile phone innovation implies that teachers have to adapt their familiar teaching methods, but it does not mean that they must abandon what works according to their experience and their leading position in the classrooms. Such engagement is essential in developing the knowledge in teachers to enable learners to acquire skills recognised in the 21st century (Van Dijk, 2020). With reference to learning, learners are expected to be active participators effectively engaged in constructing knowledge.

The pedagogical activities are in accordance with constructivist practices which engage learners actively in constructing knowledge. Since learning occurs in relation to others and other learning resources, the *'new'* learner-centred pedagogy involves engaging learners in apprenticeships for different kinds of knowledge practices, new processes of inquiry, dialogue and connectivity. These characteristics put more emphasis on learning to learn rather than memorising information without understanding (Mukhari, 2016).

As illustrated by The Network Society Theory, learners and teachers interact with digital technology as actors in teaching and learning based on the meanings they have for them. Through interaction and interplay with technological objects, learners are able to access, acquire and become proficient in the construction of meaning and knowledge development. Therefore, the integration of digital technology in teaching and learning

has the following constructivist implications for learners and teachers (Levinsen & Nielsen, 2010; Mukhari, 2016).:

- Digital competencies that focus on creativity and performance
- Strategies for meta-learning, including learner-designed learning.
- Inductive and creative modes and collaborative knowledge building
- Learner-driven content creation and contribution to communities of learning through social tagging, collaborative editing and peer review.

The foregoing discussion focused on the relationship between knowledge and mobile phone technology and the implications for teaching and learning in the networked societies. This is important to understand the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The discussion that follows highlights how inclusion and exclusion in The Network Society impacts on education.

3.10 INCLUSION AND EXCLUSION IN THE NETWORK SOCIETY

A key aspect of The Network Society concept is that specific societies (whether nation states or local communities) are deeply affected by inclusion in and exclusion from the global networks that structure production, consumption, communication and power. Castells' (2011a) hypothesis is that exclusion is not just a phenomenon that will be gradually wiped out as technological change embraces everyone on the planet, as in the case that everyone has a mobile phone, for example. He argues that exclusion is a built-in, structural feature of The Network Society.

In part, this is because networks are based on inclusion and exclusion. Networks function on the basis of incorporating people and resources that are valuable to their task and excluding other people, territories and activities that have little or no value for the performance of those tasks (Castells, 2011a). Different networks have different rationales and geographies of inclusion and exclusion - for example, Silicon Valley engineers occupy very different social and territorial spaces from criminal networks.

The most fundamental divides in The Network Society according to Castells (2011a, p. 29) are the division of labour and the poverty trap in the context of globalisation. He

characterises these as the divide between *"those who are the source of innovation and value to The Network Society, those who merely carry out instructions, and those who are irrelevant whether as workers (not enough education, living in marginal areas with inadequate infrastructure for participation in global production) or as consumers (too poor to be part of the global market)."*

The foregoing discussion focused on the relationship between inclusion and exclusion in The Network Society and the implications for teaching and learning in the networked societies. However, the discussion would be incomplete without highlighting how power and empowerment in The Network Society impact on the quality of teaching and learning.

3.11 POWER AND EMPOWERMENT IN THE NETWORK SOCIETY

In a social structure characterised by exclusion from and inclusion in different kinds of social and communication networks, power is a crucial determinant of social change (Castells, 2011a). Power can be defined as the capacity to impose one's will over another's will (Webster, 2019). In the concept of The Network Society, the chief form of power is control or influence over communication. This is because connectivity and access to networks are essential to the power of some social groups to impose their values and goals on society-at-large and of others to resist their domination.

In The Network Society, one of the most important impacts of globalisation is the way it enables us to create economic, social and political relationships that are less and less bounded by where we are located at any given time - or in other words, by our spatial location (Castells, 2011a). In traditional societies, different social relations, customs, and culture exist in separate spaces and individuals have to conform to most powerful expectations and rules - for example, in families, villages, towns, cities, and nation states. In the globalising society, these spaces lose their power to constrain individuals: people can communicate without personal contact via the global net of mass media, phone, fax and computers and are less and less linked by a common history and shared face-to-face relationships. At the same time, pre-existing traditions cannot avoid contact with, or being influenced by, distant values and forms of knowledge.

How we interpret this change in the social significance of location depends on how we interpret 'communication' (Castells, 2011a, Van Dijk 2020):

- If communication is seen as a 'one-way' street, rather like a vaccination of new information into passive recipients who absorb novel information and ideas uncritically, then individuals and local communities can be disempowered by the communication of external knowledge and culture.
- If communication is seen as a process in which new information is actively interpreted and used selectively by the recipients who take an active role in shaping the meaning of the information, then individuals and local communities can be empowered by the inflow of new ideas. The possibility of developing innovative forms of communication and knowledge sharing is empowering.

This distinction between passive versus empowering communication is a central one for understanding how mobile phones are used for development. Many critics of globalisation view it as an invasive force for cultural homogenisation promoting an inflow of information and knowledge that is becoming more uniform and standardised, due to powerful technological, commercial and cultural influences originating from centres of power and influence defining what constitutes information and knowledge and how it is shared (Castells, 2011a; Van Dijk, 2020).

A contrary view of the effects of globalising electronic communication is that although information and knowledge from major centres of power have an extraordinary level of predominance, communication is a two-way process: inflowing information is not just taken in uncritically; it is subject to local interpretation and innovative applications (Castells, 2011a; Antirroiko, 2015). These two ideas are not mutually exclusive: it is not a question of one or the other. One of the most important forces for change and development in The Network Society is the tension between the efforts of some networks to impose their values and goals and the efforts of others to resist their domination.

Empowerment, according to Castells (2011a), is strengthened by social media including networking (such as Facebook) and social movements connected via the Internet. He sees social media as evidence of trends within globalisation that promote

cultural diversity, innovation and certain kinds of freedoms. Our challenge in using knowledge and communications for development is not to determine the optimum methods of deploying equipment and cables. Instead, the challenge is to understand the ways mobile phones can both empower and disempower different groups in society. This will require us to situate programme design firmly in the context of how different social groups define knowledge and make use of communication. To do this, we will need to understand the kinds of power relationships that are involved in communication and how this influences the kind of information communicated (Van Dijk, 2020).

The foregoing discussions focused on the relationship between knowledge and digital technology as well as technological implications for teaching and learning in the networked societies. However, the theory is marred by criticisms which are outlined in the next paragraph.

3.12 CRITICISMS AGAINST THE NETWORK SOCIETY

It is important to note that Castell's argument is neither a universal truth nor does it represent the whole picture regarding the different economic and political realities existing together in the world. The binary *'inclusive/ exclusive'* nature of a networked arrangement is an important limitation of his theory and it was recognized by Castells (2004). This logic states that any given part of the network can only communicate and share information with another member of this structure, meaning that, if there is any subject disconnected from this arrangement, the latter is automatically excluded from its universe. A social binary perspective, therefore, implies that there are two very different and contrasting realities within the same planet: those lived by people who are part of the network – and are, therefore, informed and influent; and those who live disconnected to the network – hence, who are powerless and weak. The binary structure results in digital divide, a concept studied by Warschauer (2004, p 47) and defined by him as a barrier *"marked not only by physical access to computers and connectivity, but also by access to the additional resources that allow people to use technology as well."* This means that people and societies who were not yet fortunate enough to enjoy the benefits of technology, are secluded from the reality of those who are adept to it.

One main critique is that The Network Society theory contains too much technological determinism – in basic sociological terms, the belief that technology shapes social and cultural structures. Technological determinism was defined by Webster (2014:10-11) as the belief that *"technology is regarded as the prime social dynamic",* meaning that technologies must firstly be invented and then after, they will impact in society, which impels the humans and society are responding to the new. This perspective would therefore place the Internet – and the Network Society by consequence – alongside other society-disrupting inventions: the steam engine, the automobile, nuclear technology, etc. Webster (2014) believes that technology is an intrinsic part of society, and not an external factor which affects it by being introduced in its environment. Human intelligence and expertise, along with priorities in research and development, created the technologies that so define society nowadays.

Although Network Society Theory focuses on learning using digital media and various strategies to acquire knowledge in order to empower the members of society, there are factors which inhibit the development of The Network Society. These factors are principally poverty-related issues that render network use impossible for some nations (Van Dijk, 2020). Since the mode of development in a Network Society is technological and depends on knowledgeable individuals for social and economic growth, the notion of The Network Society is difficult to achieve in developing and third world countries due to poverty and lack of access to new technological tools. According to Mooketsi and Chigona (2014), the South African society is stratified and divided and although the post-apartheid South African government consists of affluent societal members who have the means to acquire and access digital technology, there are many others who live in dire poverty and lack the means to acquire or to access digital equipment.

In addition, there is also a language barrier. Mdlongwa (2012) describes globalisation as being inseparable from the English language and the epistemological and cultural values inscribed therein, to the detriment of other linguistic and cultural traditions and the ways of knowing that they embody. The language used in digital technology poses an obstacle to any other country which has languages other than English as their first language. Internet content is in English and educational media provision is facilitated by agencies that subscribe to the importance of English and Western literacy. The

access and use of digital technology is defined as empowering and democratic since technology is considered one of the greatest enablers for improved quality of life. However, the majority of African teachers and learners are unable to realise the status of being powerful due to lack of digital technology tools, lack of connectivity, lack of funds, inadequate ICT skills and lack of software in local languages. These inadequacies widen the digital divide and without Internet connectivity, those schools will never get the chance to connect and participate in the global social networks and to disseminate and share information required for social and economic growth (Mdlongwa, 2012; Mukhari, 2016).

3.13 CONCLUSION

This study is an attempt to explore the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The first part of this chapter outlined the affordances of a theoretical framework. In order to establish the rationale of placing the impact of nomophobia on the quality of teaching and learning at the core of this study, this chapter proposes a theoretical framework that serves as the foundation for the study. It is critical to have a theoretical framework as it helped the researcher to review the underlying theories, philosophies, assumptions, and methodological techniques of the study, and to formulate the basis for developing instruments for data collection.

This chapter presents a theoretical background for the study as it reviews relevant theoretical models that relate to the impact of nomophobia on the quality of teaching and learning. The theoretical framework of this study is based on The Network Society Theory to analyse the impact of nomophobia on the quality of teaching and learning. This chapter examined the aspects of The Network Society Theory that are relevant to the study. The relevance of the theoretical framework was also indicated by virtue of the ubiquitous use of mobile phones in all aspects of life. The discussion indicated the need to understand the different theories and the effect that nomophobia may have on the quality of teaching and learning in Gauteng schools.

The next chapter deals with the selection of a suitable research design and the research methodology to address the research problem.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 INTRODUCTION

Chapter Three provided the theoretical framework of the study on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. In the theoretical framework The Network Society Theory, as the chosen framework for this study was explored. The aspects of The Network Society Theory that were relevant to the study were examined as they helped the researcher to critically review underlying theories, philosophies, assumptions and methodological techniques of the study, and to formulate the basis for developing scales for data collection. The research question is: 'How can the impact of nomophobia on the quality of teaching and learning in Gauteng schools be managed more effectively?'

This chapter will present a detailed account of the research design and methods employed. The aim of the research, research methods, and the design of mixed-method single case study research (MMSCR) methodology will be portrayed. In addition, the study will address the population selection, sampling techniques, research instrumentation and data collection procedures. Data analysis and processing methods and the presentation of data will also be examined and outlined.

This chapter will include a segment on the rationale for choosing a mixed-method single case study research design. Finally, trustworthiness, validity and reliability of a mixed-methods case study research design is explained in an attempt to provide a clear understanding and meaning of the relevant terminology. Ethical considerations towards participants in the quantitative phase (Phase 1) and respondents in the qualitative phase (Phase 2) will also be expanded upon in this chapter.

4.2 PURPOSE OF THE STUDY

The planning stage focuses on identifying the research questions or other rationale for doing a case study, deciding to use the case study strategy (compared with other

methods), and understanding its strengths and limitations (Yin, 2014). Clearly defining the research problem is probably the most important step in the entire research project. As such, every case study should begin with a comprehensive literature review (see chapter 2) and a careful consideration of the research questions and study objectives (Baskarada, 2014).

This study investigated managing the impact of nomophobia on the quality of teaching and learning in a public, secondary Gauteng school (the case). Furthermore, the school has a ban on the use of mobile phones in the classroom. To do this, the study has to answer the research problems and realise the study objectives through the utilisation of appropriate research design and methods. These research problems and objectives are listed in section 1.7 of chapter 1 but repeated below for a quick reference.

4.2.1 Research questions

To help provide an answer to the fundamental research question, the following secondary research questions or sub-questions were developed:

- What is nomophobia and how can it be overcome?
- Do teachers and learners in the Gauteng school (the case) perceive themselves to suffer from nomophobia and to what extent?
- In which manner or way do teachers and learners perceive that nomophobia affects the quality of teaching and learning in the Gauteng school (the case)?
- How can the negative impact of nomophobia on teaching and learning in Gauteng classrooms be managed effectively?

4.2.2 Study objectives

The main purpose or aim of this study is to determine how the impact or effect of nomophobia, encountered by teachers and learners in Gauteng schools, could be managed effectively to improve the quality of teaching and learning. The sub-aims or objectives of the study are to:

- Define and describe the concept of nomophobia and how it can be overcome.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the teachers' and learners' perceptions of the impact or extent of nomophobia on the quality of teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on the quality of teaching and learning in Gauteng schools can be managed effectively.

The scientific realisation of this set of objectives and consequent answers to the research questions will assist the researcher in the investigation and to understand how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

4.3 RESEARCH DESIGN

4.3.1 Introduction

De Vaus (2006) refers to research design as the overall strategy that is chosen to integrate the different components of the study in a coherent and logical way. This ensures that the researcher will effectively address the research problem; it constitutes the blueprint for the collection, measurement and analysis of data.

McMillan and Schumacher (2014) define research design as a plan that describes the conditions and procedures for collecting and analysing data. Furthermore, they say that a research design describes the procedures for conducting the study, including when, from whom and under what conditions the data will be obtained. The purpose of the research design is to specify a plan for generating empirical evidence that will be used to answer the research questions. The intent is to use a design that will result in drawing the most valid, credible conclusions from the answers to the research questions.

This study will adopt a mixed methods single case study research (MMSCR) design. The researcher agrees with the view advanced by Creswell (2014) that the research design for this mixed methods research study will provide specific direction for procedures used in this study, such as data collection, instrumentation, data analysis

and data presentation. Gray (2014) highlights that, in a mixed methods research study, quantitative and qualitative data are collected sequentially and involve the integration of data at one or more stages in the process of the research. These approaches are complementary since, as McMillan and Schumacher (2014) aver that qualitative findings usually inform and support the quantitative results.

For this mixed-methods single case study research study, the explanatory sequential research design will be used. The research design in this study will involve two distinguishable, but complementary phases:

- **Phase 1**: The researcher will collect quantitative data and analyse it statistically (Creswell, 2014). Thus, Phase 1 will assist in determining whether teachers and learners perceive themselves to suffer from nomophobia. Phase 1 will also determine if teachers and learners perceive that nomophobia has an impact on the quality of teaching and learning. Phase 1 oftentimes also expedites the selection of appropriate questions for Phase 2.
- **Phase 2**: The results of Phase 1 will then be refined and built on by employing a qualitative approach (Creswell, 2014). Furthermore, in Phase 2 teachers and learners will make recommendations on how to manage the impact of nomophobia on the quality of teaching and learning.

Why is the explanatory, sequential research design chosen for this study? In short, the explanatory, sequential research design ably assists the researcher to use the qualitative data in elucidating matters in finer detail to add meaning to the quantitative results (McMillan & Schumacher, 2014; Creswell, 2014). The net effect allows for an in-depth understanding of the sub-questions posed in this study. This detailed understanding leads to the management of the impact of nomophobia among learners and teachers on the quality of teaching and learning in Gauteng schools.

4.3.2. A case study as research strategy

Case study research involves “intensive study of a single unit for the purpose of understanding a larger class of (similar) units … observed at a single point in time or over some delimited period of time” (Gerring, 2004, p. 342). As such, case studies

provide an opportunity for the researcher to gain a deep holistic view of the research problem, and may facilitate describing, understanding and explaining a research problem or situation (Baskarada, 2014).

A case study is an in-depth analysis of a single entity. It is a choice of what to investigate, identified as a single case or the case (Stake, 2013 in McMillan & Schumacher, 2014). Creswell (2008 in McMillan & Schumacher, 2014) refers to a case study as *"an in-depth exploration of a bounded system (e.g., an activity, event, process or individuals) based on extensive data collection"* (p. 370). Being bounded means being unique according to place, time and participant characteristics.

The design stage focused on defining the unit of analysis and the likely cases to be studied, developing theory/propositions and identifying issues underlying the anticipated study, identifying the case study design (single, multiple, holistic, embedded), and developing procedures to maintain case study quality (Yin, 2014). Research design logically links the research questions to the research conclusions through the steps undertaken during data collection and data analysis. (Baskarada, 2014). The logic linking the data to the propositions should also ensure the correct type and amount of relevant information is collected. The criteria for interpreting the findings should include any relevant rival theories/explanations so that relevant data can be collected during the data collection stage. Common design-related issues include choosing an inappropriate unit of analysis, inappropriate case selection, insufficient attention to alternative theories/hypotheses, and more/fewer cases selected than necessary (Baskarada,2014).

The unit of analysis defines what the case is—for example, an event, a process, an individual, a group, or an organisation (Yin, 2014). As the literature is not consistent with respect to the terminology—for example, Gerring (2004) advocates a taxonomy in which units comprise cases—clearly defining relevant terms is critical. In the case of an event or a process, defining the time boundaries (i.e., the beginning and the end of the case) is imperative. While it may sound obvious and simple, identifying the appropriate unit of analysis requires careful consideration, as any confusion over it may invalidate the whole study (Gerring, 2004; Baskarada, 2014). As the choice of the

theoretical lens is entirely subjective, there are no explicit guidelines for how exactly this should be done (Walsham, 2006). Nevertheless, from a pragmatic standpoint, theoretical foundations should not be dated, immature, overused, or overly practitioner-oriented (Pan & Tan, 2011). When the case study data uncovers constructs that do not neatly fit within the foundational theoretical schema, the researcher may have the opportunity to extend it by including additional constructs and/or propositions. The alternative and reasonably controversial view argue against any theoretical preconception prior to data collection with a view that any theory should purely emerge from the raw data (Baskarada, 2014).

Individual cases may be selected based on convenience, purpose, and probability. According to Yin (2014), reasons for justifying single-case studies include studying a critical case, an extreme case, a representative or typical case, a revelatory case (involving a novel situation), and a longitudinal case. Purposive case selection provides an ability to collect the most relevant data, and longitudinal cases provide an ability to identify trends over time.

According to Yin, in multi-case studies, each case should be selected so that it either predicts similar results (literal replication) or predicts contrasting results but for anticipatable reasons (theoretical replication). If multiple cases lead to contradictory results, the preliminary theory should be revised and tested with another set of cases (Yin, 2014). Both single and multiple designs can be either holistic (one unit of analysis per case) or embedded (multiple units of analysis per case).

A common concern about case studies is that they provide little basis for scientific generalization. "How can you generalize from a single case?" is a frequently heard question (Baskarada, 2014). In fact, scientific facts are rarely based on single experiments; they are usually based on a multiple set of experiments that have replicated-the same phenomenon under different conditions. The response of some case study researchers to this criticism has been to deny that their work is designed to produce scientific generalizations. Thus, Stake argues that case studies facilitate learning on the part of those who use them; and that this involves ‘naturalistic generalization’, a quite different kind of generalization from that which is characteristic

of science (Stake, 2013). Following much the same line, Lincoln and Guba question the appropriateness of law-like generalizations in social science and argue that what case studies offer are 'working hypotheses' whose appropriateness for understanding other cases (that is, their transferability) can only be assessed by comparing the 'fit' - the similarities - between source and target cases (Lincoln and Guba, 2011). In this study, the arguments for naturalistic generalization and transferability will capture one way in which case study research may be used - by other researchers as well as by lay people - they do not offer a substitute for the drawing of general conclusions in research reports. To deny the possibility of case studies providing the basis for empirical generalizations is to accept the views of their critics too readily. It must be pointed out that, in practice, much case study research has in fact put forward empirical generalizations. Indeed, it can be suggested that in at least one respect this is unavoidable.

Yin (2014) provides advice on case study research, which is acknowledged in this study:

- The argument or theory should be made clear at the beginning of the case study.
- The argument should be grounded in a research literature rather than specific related to the case study.
- Findings should show how the results of the case study either challenged or supported the theory or argument.
- If the findings support the theory, a logical and sound argument needs to be made by researchers to show how these findings can be generalised to similar situations.
- Examining rival hypotheses will strengthen claims of analytical generalisation.
- Beyond making a claim, the generalizability of the findings from a single case study increases immeasurably if similar results have been found with other case studies—whether such studies already existed in the literature or were completed after the first case study.

This study will use a single-case study which will be based on purposeful sampling where the unit of analysis will be teachers and learners from a single public secondary

school in Gauteng who will provide their perceptions on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Although the school chosen for the case is representative or a typical case from the population, the researcher must caution that teachers and learners from different public secondary schools are unique in terms of composition of demographics, culture and socio-economic backgrounds.

4.3.3 Mixed methods research design

Mixed methods research is a good design to use since it builds on the strengths of both quantitative and qualitative data (Creswell, 2014; McMillan & Schumacher, 2014; Flick, 2018). In this design, the quantitative data was collected first (Phase 1) and qualitative data was collected second (Phase 2) to elucidate, elaborate on, or explain the quantitative findings. In the quantitative phase (Phase 1) a census approach within the case will be adopted for the teachers and learners who will be surveyed to determine their personal perceptions on nomophobia and its impact on teaching and learning. In the qualitative phase (Phase 2), fewer teachers and learners will be selected using a qualitative approach to determine their perceptions on how the impact of nomophobia on the quality of teaching and learning can be managed in Gauteng classrooms A structured questionnaire with closed-ended questions will be used for the quantitative phase and semi-structured interviews with open ended questions will be used in the qualitative phase to determine how to manage the impact of nomophobia on the quality of teaching and learning by both learners and teachers in Gauteng schools.

Some disadvantages associated with quantitative approaches like insensitivity to emotions, feelings, insights, motives, intents, views and opinions of the subjects studied will be catered for by the qualitative research aspect of this study (McMillan & Schumacher, 2014; Creswell, 2014). With the qualitative approach, participants could respond in their own words, rather than being forced to choose from fixed responses, as the quantitative method demands. Also, with a quantitative approach, researcher bias and a limitation of the qualitative approach is eliminated (Creswell, 2014; McMillan & Schumacher, 2014).

Regarding Phase 2, since the researcher propounds open-ended questions to the participants in order to gain insight into their beliefs, ideas, opinions and views. McMillan and Schumacher (2014) remonstrate interviews are the most significant tool for data collection in the qualitative research approach. Moreover, using the two approaches (shown as Phase 1 and Phase 2 above) assists the researcher with an in-depth exploration of the topic thus contributing to the poly-dimensional outlay of this study.

By using the mixed-methods research methodology in this study, the researcher believes and agrees with the view advanced by Teddlie and Tashakkori (2009) that any one viewpoint or methodology (quantitative or qualitative) does not hold the authoritative key to truthfully answering the research questions. The researcher's decision for this choice of research methodology was further buttressed by Mertens (2010) who emphasised the view of Teddlie and Tashakkori (2009), that mixed-methods research has a particular value when a researcher is trying to solve a problem that is present in a complex schooling or social context. Further information relating to the explanatory, sequential research design that has been chosen for this study will be elaborated on in the next paragraph.

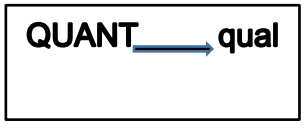
4.3.4 The explanatory, sequential research design

As described above, both quantitative and qualitative research approaches have been used in this study. When both quantitative and qualitative data are utilized together it provides a better understanding of the research problem than employing either type alone (Creswell, 2014). Emphasizing on this Creswell and Plano Clark (2011) have stated that the quantitative approach yields specific measurable data that can be statistically analysed, whereas qualitative data offer different perspectives of respondents on the study topic and provide a complex picture of the situation. The mixed methods approach is selected in this study as it creates more opportunity to involve various stakeholders in different ways and help to triangulate data obtained through various instruments. Furthermore, the same authors explain that the combined method could help to build on the strengths of both approaches as quantitative data yield specific numbers that can be statistically analysed whereas the qualitative data

offer the different perspectives which respondents have on the topic under study. More importantly, utilizing both quantitative and qualitative data in combination is preferred in this study due to its suitability to make cross checks on whether the result obtained from the two types of data analyses yield similar or dissimilar outputs.

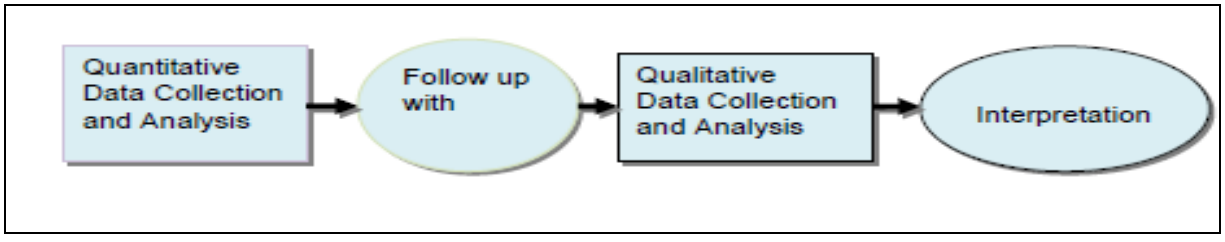
As discussed above in Section 4.3.2, the researcher decided to use explanatory sequential mixed design because it is a suitable design that helps to make predictions about how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The predictions will emanate basically from the quantitative research that will be carried out in the first phase of the study. In relation to this Creswell and Plano Clark (2011) illustrate that the explanatory sequential design becomes appropriate when the purpose of the study is for prediction of outcomes, a priority and greater weight placed on quantitative data (QUAN); quantitative research with greater weight is sequenced first and followed with a small qualitative (qual) research with the intention of refining the quantitative results.

The notation used for this study will be:



In accordance with the above scholars' elaboration, the explanatory sequential mixed methods design not only entails a two-phase study but also gives unequal weight to quantitative and qualitative data collection and analysis. Furthermore, Biesta (2010) adds that '*Explanatory Sequential Mixed Methods Design'* appears appropriate if the main aim of the study is to discover causes, factors or correlations and, consequently, engender useful and influential knowledge to change the course of events. In line with the discussion made in section 4.3.2 and the explanation given by the above scholars, the explanatory sequential mixed method design that is adopted in this study is illustrated in the figure below:

Figure 4. 1: The Explanatory Sequential Mixed Methods Design (adapted from Creswell 2014: 541)



In line with the above figure and clarification regarding key features of explanatory sequential design, the researcher plans to collect and analyse the quantitative data in the first phase inquiry and carry out a small qualitative research in the second phase of the study. In fact, the qualitative data that are collected and analysed in the second phase of the study is used to explain or elaborate the outcomes of the quantitative research that will be carried out in the first phase of study. Accordingly, the general picture regarding managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools will be identified from the quantitative data analysis of the first phase and this result may be further refined, extended or explained with the second phase of the qualitative study. With this framework in mind, the quantitative data will be collected by adapting the Nomophobia Questionnaire (NMP-Q) (Yildiram & Correia, 2015). The quantitative data that was collected through the above-mentioned instrument was analysed statistically in the first phase of the study. The qualitative data that was gathered through semi structured interviews and open-ended questions that were a part of the questionnaire were used to refine and clarify the quantitative result.

4.3.5 Significance of a mixed methods single case research (MMSCR)

MMSCR (Mixed methods single case research) is defined as research in which single case quantitative and qualitative case study methodologies, and their accompanying sets of methods and techniques, are integrated to answer research questions that concern one case (Onghena, Maes & Heyvaert, 2019). The exploration of MMSCR, and its distinct nature, is important from the perspective of qualitative case study research, from the perspective of single case quantitative research, and from the perspective of mixed methods research. We will take each of these perspectives in turn.

For qualitative case study research, it is important to realize that quantitative research is not antithetical to idiographic research or to research with a focus on one case. In fact, single case study research has this focus on the case, and in terms of 'unit of research' is located at exactly the same level as qualitative case study research. In this sense, they might be naturally compatible partners. Furthermore, the addition of baseline measurements, time series data, controlled intervention, and formal data analysis might strengthen or enrich the understanding of 'the case', certainly if questions regarding efficacy, explanation, and prediction are involved (Barlow, Nock & Hersen, 2009; Kazdin, 2011).

From the perspective of single case quantitative research, the addition of an integrated qualitative case study might be crucial to give context, to put narrative flesh on the bones of the statistical analysis, and ultimately to provide a basis for replication and generalization. Integration of observations, interview material, and document information is especially relevant if the research question is not merely 'Does it work?' but also involves issues of process, feasibility, appropriateness, and meaningfulness (Pearson, Wiechula, Court, & Lockwood, 2005).

The dominance and close-to-exclusive reliance on the quantitative tradition constrains our knowledge. The perspective and yield from a study are very much influenced by the methods we use. The importance of multiple ways of examining phenomena is conveyed better by looking at other areas of science. From the perspective of mixed methods research, it is important to thematize MMSCR as a distinct approach in order to disentangle the level dimension (case versus group level) and the methodological approach (qualitative versus quantitative). Too frequently, research at the case level is exclusively conceptualized as qualitative research and research at the group level is conceptualized as quantitative research, with the prototypical example of the mixed methods study as 'cases within surveys or 'surveys within cases' (Yin, 2014). Also, for mixed methods research, there is a growing awareness that the intensive study of a single case has its own merit and yields evidence that an extensive study of a sample cannot provide (Van Ness, Murphy & Ali, 2017). Mixed methods research can move beyond the discursive and isolated remarks about the necessity, the benefits or the expediency of combining single case quantitative and qualitative case studies and offer

an organized and integrated conceptual framework and methodological toolbox (Creswell, 2014; Mertens, 2010; Plano Clark & Ivankova, 2016).

From a practical point of view, MMSCR can be preferred over group research when rare or unique conditions are involved, or when it is impossible to obtain a large homogeneous sample of cases under similar conditions. MMSCR can also be used for the development of a new theory, and it can be used for verifying existing theories and empirically testing specific hypotheses. It is for these reasons that the researcher has chosen the MMSCR to better understand how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

4.3.6 Assumptions of the research design

This study will use a mixed methods single case study research (MMSCR) design to guide data collection, processing and evaluation when investigating the how to manage impact of nomophobia on the quality of teaching and learning in Gauteng schools. The research design makes the following assumptions:

- Ethical aspects in the study shall be observed.
- The aim in constructing a conceptual model is to capture all the relevant information about the system domain provided in the requirements document so that this model can form the basis for the structure of the system. An invariant is any condition on the objects of a conceptual model, their attribute values and links, which must hold for the requirements to be satisfied and the consistency of the model to be guaranteed. Such a condition represents a constraint on the real-world entities modelled (i.e., a constraint on the system domain) (Velichova, 2013). The invariant in this study is that the one selected school (the case) shall not represent all public, secondary Gauteng schools that ban the use of mobile phones in the classroom. The one selected school (the case) was the target population.
- The constructs used in this study, nomophobia, the quality of teaching and learning are difficult to measure but not impossible. These constructs have different meanings to different people.

- Consider measuring nomophobia using a scale that assesses the frequency of occurrence of symptoms of nomophobia. The questions eliciting the symptoms are observed (manifest) variables, but a response to each question is not, by itself, equivalent to nomophobia. Rather, each item is considered to be influenced by nomophobia and perhaps to be influenced by other factors as well as random error. Nomophobia is considered to be a latent (unobserved) variable whose properties are inferred from observing the set of variables that serve as manifest indicators. If the mean of observed variables differs for subgroups of educators and learners, the conclusion may be that the groups differ in levels of nomophobia, but it also may be the case that extraneous influences are giving rise to the observed difference. To make valid comparisons of subgroups, certain types of factorial invariance are required (Meredith & Teresi, 2006).
- The four assumptions about invariance in perception as outlined by Cutting (1983) are adopted in this study:
    - ✓ Mathematics is an appropriate descriptive language for perception,
    - ✓ Mathematical truths are transportable into perception without change of meaning,
    - ✓ Mathematical imports are useful in explaining perception, and
    - ✓ Perceptual invariants, like their mathematical counterparts, are absolute and not subject to threshold considerations.
- The one selected school (the case) is unique and does not represent all Gauteng schools.
- The one selected school (the case) was studied within the boundaries of the case.
- The pilot study serves as a means of assessing content validity.
- Recordings were audible enough to be easily transcribed.
- The interviewer effectively conducted the semi-structured interviews.
- Interviewees freely and openly responded to the interview.
- The semi-structured interview unveiled how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

4.3.7 Summary

The researcher has chosen a mixed methods single case study research design (MMSCR). The mixed method design uses an explanatory sequential design in which the collection and analysis of quantitative data (Phase 1) was the primary emphasis. Qualitative (Phase 2) data collection and analysis follows to explain and elaborate on the quantitative findings. The paragraph that follows will discuss the research approach.

4.4 RESEARCH APPROACH

Creswell (2014) states three approaches to research as quantitative (positivistic, scientific) approach, qualitative (interpretive) approach, and mixed methods. This study used a mixed methods single case research (MMSCR) approach to achieve the study objectives. Furthermore, the mixed methods study will follow an explanatory sequential mixed method design. The researcher believes that the MMSCR of the study objectives yields educationally important findings. These findings will inform the DoE at school, circuit, district, provincial and national levels how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. Furthermore, more research needs to be conducted on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. It is hoped that the study will inform policy makers of managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

The development and use of mixed methods designs have increased in recent years as researchers have realised that often the best approach to answering research questions is to use both quantitative and qualitative methods in the same study (Cook & Kamalodeen, 2019). Mixed methods designs are also appropriate when there are individuals or a small group whose thinking differs significantly from that of the majority. Mixed methods designs are very helpful in identifying issues, factors and relevant questions that can become the focus of the study (Creswell & Plano Clark, 2011; Creswell, 2013).

Although the term ‘mixed methods’ has been used extensively to label research, only recently has it been given serious consideration by scholars. Consequently, you will

find various types of studies referred to as ‘mixed method, mixed methodology, and multiple methods’ in the literature. Other names used less frequently, include ‘multimethod, multiple methodology, blended research, triangulated studies, hybrid and integrative research’ (Johnson, Onwuegbuzie & Turner, 2007). According to Teddlie and Tashakkori (2009), these studies represent a variety of different qualitative and quantitative characteristics which are manifest in language, philosophical assumptions, orientation, research questions, sampling, data collection procedures, types of data, types of data analysis and conclusions.

Many different definitions of mixed methods studies can be found, and there is a trend to use the term ‘mixed methods’ rather liberally to include a study that has some degree of both quantitative and qualitative methods. McMillan and Schumacher (2014) believe that it is best to use the term ‘mixed methods’ for studies that include substantial contributions from each approach. The researcher feels that the following definitions are appropriate for the study:

> *“Research in which the investigator collects and analyses data, integrates the findings, and draws inferences using both quantitative and qualitative approaches or methods in a single study or a program of inquiry” (Tashakkori & Creswell, 2007, p.4).*

> *“Research in which a researcher combines elements of quantitative and qualitative research approaches (e.g., use of quantitative and qualitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and collaboration” (Johnson et al., 2007, p. 123).*

These definitions imply that the study must have an integrative character. The definitions also indicate that mixed methods studies combine quantitative and qualitative paradigms in meaningful ways. The unique nature of mixed methods will provide insights for the study that are not possible when either the quantitative or qualitative approaches are used independently.

One of the forms of research inquiries is the ‘case study’, which McMillan and Schumacher (2014) define as research that examines a bounded system (i.e., a case), over time in detail, employing multiple sources of data found in the setting. For this study, a method is required that can be used to explore factors such as participants' perspectives and the influence of technology on the quality of learning in teaching (Simons, 2009). Development of case study research in education, focuses on the need to determine the impact of educational programs and provide relevant evidence for policy and practice decisions that support social and educational change.

While the case study method has traditionally been classed as soft research, case studies are particularly difficult to execute well (Yin, 2014). Case studies allow for confirmatory (deductive) as well as explanatory (inductive) findings (Baskarada, 2014; Yin, 2014), can be based on single or multiple cases, and can include qualitative and/or quantitative data. They can be exploratory, descriptive, or explanatory, and they have been described as the preferred research method when *how* and *why* questions are posed, the investigator has little control over events, and the focus is on a contemporary phenomenon within a real-life context (Yin, 2014).

This study concurs with Stake (2013) who argues that case studies are particularly well-suited for naturalistic generalisations that are based on experiential transformation of tacit knowledge into explicit knowledge. In any case, case studies are particularly well-suited for extensive and in-depth descriptions of complex social phenomena. In fact, the depth of analysis is one of the primary virtues of the case study method (Gerring, 2004; Baskarada,2014). As a research method, case studies are commonly used in education (Stake, 2013; Baskarada, 2014). However, *“given the time required, the rich, in-depth, nature of the information sought, and the need to achieve credibility,”* case studies can also be costly to conduct (Baskarada, 2014, p 4). Other challenges identified by Baskarada include choosing the method for selecting cases, reporting the basis for selecting cases, and integrating findings across several cases when the findings in one were inconsistent with those in another.

Exploratory case studies may be undertaken prior to the definition of the research questions and hypotheses. Exploratory case studies aim to find answers to the

questions of ‘what’ or ‘who’. Exploratory case study data collection method is often accompanied by additional data collection method(s) such as interviews, questionnaires, experiments etc. Accordingly, they are mainly used for theory building.

Descriptive case studies aim to analyze the sequence of interpersonal events after a certain amount of time has passed. Case studies belonging to this category usually describe culture or sub-culture, and they attempt to discover the key phenomena. Descriptive case studies try to completely describe different characteristics of a phenomenon in its context and so they are also mainly used for theory building. Such studies may also identify differences between individual cases with a view of potentially generating a classificatory framework (Gerring, 2004; Baskarada, 2014).

Explanatory case studies may be undertaken to investigate causal relationships; hence, they are mainly used for theory testing. They are characterised by *how* and *why* research questions because they investigate the relationships that are proposed between different theory components (Yin, 2014). Any inconsistencies between a preliminary theory and the evidence may lead to theory modification and enhancement (Aneshensel, 2012). In this study, the researcher applies an explanatory mixed method case study methodology to study how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Stake (2013) differentiates between intrinsic, instrumental, and collective case studies. Intrinsic case studies only aim at acquiring better understanding of the particular case of interest. Thus, such case studies are not used for theory building. Instrumental case studies provide insights into an issue or are used to refine a theory, and collective case studies comprise several instrumental case studies. However, Stake also argues that studies seldom fit neatly into such categories, and that researchers have to make a strategic choice in deciding on the scope of the case study, since everything cannot and need not be understood.

Significant contributors to the field of case study research are Stake, Merriam and Yin (Yazan, 2015). Stake who is an educational psychologist with an interest in developing program evaluation methods, used a constructivist orientation to case study. This resulted in placing more emphasis on inductive exploration, discovery, and holistic

analysis that was presented in thick descriptions of the case (Stake, 2013). Similarly, Merriam and Tisdell (2015) used case study research to explore and evaluate educational programs. Merriam and Tisdell's (2015) approach emphasized defining and understanding the case through the products of inquiry. Merriam and Tisdell (2015) describe case study research by its characteristics: particularistic, descriptive and heuristic, highlighting the purpose and qualitative nature of case study research, the focus on a specific entity and, the motivation to understand and describe the findings.

This study adopts a mixed methods single case study research (MMSCR) design, to assist the researcher to achieve the study objectives, that will guide the study from the beginning of the investigation to the end. The case study design will be explanatory in nature and will be an instrumental case study.

4.5 RESEARCH PARADIGM

Creswell (2014) states that because all researchers have hidden ideas or philosophical assumptions that influence the approach they take to their studies, researchers should clearly identify these basic beliefs or worldviews. Their philosophical stance determines the direction in which the research flows and ensures that the specific methods are congruent with the approach. While supporting the importance of establishing one's worldview, other researchers have employed the term paradigm (Mertens, 2010; Lincoln et al., 2011; Hussein, 2015). For the purposes of this study, this researcher also uses the term, paradigm.

Johnson and Christensen (2019) describe a paradigm as the framework of beliefs and assumptions through which a researcher understands and relates to the world. This description strengthens their earlier claim that, a researcher's paradigm is expressed in his ontology (his views of the nature of reality), his epistemology (his view about how knowledge is increased), axiology (his views on the roles that values play), methodology (his views on research methods) and rhetoric (his views on the best language to use) (Johnson & Christensen, 2019).

Grix (2002: p.177) as in Daniel and Harland (2018) considers ontology as *"the starting point of all research".* Ontology is concerned with how reality is perceived by

respondents (Daniel & Harland, 2018). The ontological nature of the research is important because it influences the researcher's knowledge of the reality of the perceptions of nomophobia among teachers and learners and the impact it has on the quality of teaching and learning in Gauteng classrooms. To gain these perspectives, the researcher uses a mixed methods approach and makes use of closed ended questionnaires (quantitative) and semi-structured interviews with open-ended questions (qualitative data). Epistemology, on the other hand, is concerned with what we know about reality and how we can know it (Willis, 2007; Daniel & Harland, 2018). It looks at the foundation of knowledge, its nature and forms, its acquisition and its communication to others (Cohen, Manion & Morrison, 2007; Daniel & Harland, 2018).

The focus of the study is to investigate the effect that learner and teacher nomophobia has on the quality of teaching and learning in Gauteng classrooms, and thus the Pragmatic paradigm was adopted (Kivunja & Kuyini, 2017). What is needed is a worldview which would provide methods of research that are seen to be most appropriate for studying the phenomenon at hand. This approach allows a combination of methods that in conjunction could shed light on the actual behaviour of participants, the beliefs that stand behind those behaviours and the consequences that are likely to follow from different behaviours (Martens, 2015; Kivunja & Kuyini, 2017). This paradigm advocates a relational epistemology (i.e. relationships in research are best determined by what the researcher deems appropriate to that particular study), a non-singular reality ontology (that there is no single reality and all individuals have their own and unique interpretations of reality), a mixed methods methodology (a combination of quantitative and qualitative research methods), and a value-laden axiology (conducting research that benefits people) (Kivunja & Kuyini, 2017). The pragmatic paradigm is normally associated with the mixed methods research approach (Creswell, 2014).

Reality is socially constructed and therefore multiple mental constructions can be apprehended, some of which may be in conflict with one another. Furthermore, perceptions of reality may change as concepts of nomophobia and the quality of teaching and learning are socially constructed phenomena that mean different things to different people (Mertens, 2010; Daniel & Harland, 2018).

4.6 POPULATION AND SAMPLING

4.6.1 Introduction

In this section, the study provides the methodological and logistical issues of the study. This includes the selection of participants, data collection, data analysis, measures for reliability and validity (quantitative phase – Phase 1), measures of trustworthiness (qualitative phase – Phase 2) and ethical considerations. The researcher applies an explanatory mixed methods single case study research (MMSCR) methodology in this study, on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. To do this, the researcher pays attention to important strategic issues in designing a mixed methods case study.

4.6.2 Study population

In research, the group of subjects or participants from whom the data are collected is referred to as the sample (McMillan & Schumacher, 2014). The sample can be selected from a larger group of persons identified as the population. This study necessitates further discussion of the term population. A population is a group of elements or cases, whether individuals, objects or events that conform to specific criteria and to which we intend to generalise the results of the research. This group is also referred to as the theoretical population or the universe. The target population is often different from the list of elements from which the sample is selected, which is termed the survey population or sampling frame (McMillan & Schumacher, 2014). In this study, the theoretical population is made up of all the teachers and learners in public, secondary schools in South Africa where the use of mobile phones are banned.

The target population is the group of individuals that the intervention intends to conduct research in and draw conclusions from. The theoretical population is often different from the list of elements from which the sample is selected, which is termed the survey population or sampling frame (McMillan & Schumacher, 2014). The target population constitutes a Gauteng public secondary school (the single case) that has 1020 learners and 42 educators in 2021. A Gauteng school has been selected, as I am interested to see the perceptions of teachers and learners on how to manage the impact of

nomophobia on the quality of teaching and learning in Gauteng. Thus, although the intent of the research is to generalise to all teachers and learners that are from schools where mobile phones are banned, the sampling frame places some limitations on such generalisations.

South Africa has more than 25,000 schools, 23,000 of which are public schools that cater for more than 12-million learners (Passmark, 2018). A complete coverage of the theoretical population would be difficult. The researcher has selected one school (the single case) from all the Gauteng public, secondary schools that have a ban on the use of mobile phones in the classroom. This sets boundaries between the schools in Gauteng that allow the use of mobile phones in classrooms and those that do not. This school was selected for the case because it has the setting of boundaries on the study units that possess specific characteristics in the theoretical population, and it is a typical case in the theoretical population. The researcher opted for a census approach within the case for the quantitative phase (Phase 1) and purposive sampling for the qualitative phase (Phase 2) of the study.

4.6.3 Census and sampling approaches in mixed methods single case study research (MMSCR)

McMillan and Schumacher (2014) define a sample as the group of subjects from whom data are collected and are often representative of the population. Strydom and Venter (2003) support this definition by saying that a sample comprises the elements of the population considered for actual inclusion in the study. The elements referred to in this study are teachers and learners from a public, secondary Gauteng school where the use of mobile phones is banned. The elements include teachers and learners of different genders, ages and socio-economic background. The researcher felt that the case study is appropriate because the chosen school in Gauteng has a context relevant to the phenomenon - in this study, investigating the impact nomophobia (the phenomenon) on the quality of teaching and learning in a Gauteng school (the context) (Yin, 2014).

Researchers apply two major sampling techniques to conduct empirical studies. These are probability and non-probability sampling techniques (McMillan & Schumacher,

2014). In probability sampling subjects are drawn from a larger population in such a way that the probability of selecting each member of the population is known. This type of sampling is conducted to efficiently provide estimates of what is true for a population from a smaller group of subjects (sample). That is, what is described in a sample will also be true, with some degree of error, of the population. When probability sampling is done correctly, a very small percentage of the population can be selected.

Non-probability sampling does not include any type of random selection from a population, this form of sampling is the most common type in educational research. The researcher uses subjects who happen to be accessible or who may represent certain types of characteristics (McMillan & Schumacher, 2014). McMillan and Schumacher (2014) identify non-probability sampling techniques as convenience sampling, purposive sampling and quota.

Typically, a case study has a sample of one (i.e., the bounded case, but note that sampling can occur within the case). It was effective to use the method of purposeful sampling for the selection of the case in the study. Purposeful sampling allowed the researcher to focus in depth on a phenomenon (the impact of nomophobia) and to explore information rich cases from which a great deal can be learnt about issues of central importance (on the quality of teaching and learning) to the research (Patton, 2001). Thus, in purposeful sampling it is assumed that the investigator wants to discover, understand and gain insight about the research topic and therefore must select a sample from which the most can be learned. Many authors refer to samples from which most could be learned as the information rich portion of the population (Merriam & Tisdell, 2015; Strydom & Venter, 2003; McMillan & Schumacher, 2014). They maintain that the power and logic of purposeful sampling is that a few cases studied in-depth yield many insights about the topic. The strengths of purposeful sampling are that it is less costly and time consuming, is easy to administer, usually ensures high participation rate by subjects, generalisation is possible to similar subjects, collects data from information rich subjects, and assures receipt of needed information (McMillan & Schumacher, 2014).

Surbhi (2017) explains that census and sampling are two methods of collecting survey data about the population that are used in research. Census refers to the quantitative research method, in which all the members of the population are enumerated. On the other hand, sampling is the widely used method, in statistical testing, wherein a data set is selected from the large population, which represents the entire group. Census implies complete enumeration of the study objects, whereas sampling connotes enumeration of the subgroup of elements chosen for participation. These two survey methods are often contrasted with each other.

Surbhi (2017) defines census as a well-organised procedure of gathering, recording and analysing information regarding the members of the population. It is an official and complete count of the target population, wherein each unit of the target population is included in the collection of data. In this study, the target population is all the teachers and learners in the Gauteng school (the case) through which the data can be acquired. With this technique, the enumeration is conducted about the population by considering the entire population. Hence this method requires huge finance, time and labour for gathering information. Furthermore Surbhi (2017) says that the results drawn by conducting a census is accurate and reliable and the margin of error is negligible. Since the Gauteng school (the case) has a total of 1020 learners and 42 educators, the researcher has opted to use a census approach for the quantitative phase (Phase 1) of the study, since the target population is not too large.

For the qualitative phase (Phase 2), the researcher chose to apply convenience sampling (also called available sampling) where a group of subjects are selected based on being accessible or expedient. Convenience samples are widely used in quantitative and qualitative studies because this may be the best the researcher can accomplish due to practical constraints, efficiency and accessibility (McMillan & Schumacher, 2014). The strengths of convenience, non-probability sampling is it is less costly and time consuming; ease of administration; usually assures a high participation rate; and generalisation is possible to similar subjects. It is with all these strengths in mind that convenience, non-probability sampling was used in the qualitative phase (Phase 2) of this study. The researcher cannot underplay the weaknesses of this method of sampling either, and they are: it can sometimes be difficult to generalise to other

subjects; less representative of an identified population; results are dependent on the unique characteristics of the sample; and there is a greater likelihood of error due to experimenter or subject bias (McMillan & Schumacher, 2014; Vehovar, Toepoel & Steinmetz, 2016). McMillan and Schumacher (2014) maintain that the purposeful sampling technique allows the researcher to select elements from the population that were representative or informative about the topic of interest.

This study applies purposeful sampling for the selection of the case (a Gauteng public secondary school), a census approach for the quantitative phase (Phase 1) of the study and purposive sampling for the qualitative phase (Phase 2). This sampling enables the researcher to select teachers and learners from a secondary public school in Gauteng (the typical case) where mobile phones are banned to make informed decisions about managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Hence, this study was divided into two phases, vis: the quantitative phase (Phase 1) and the qualitative phase (Phase 2).

4.6.3.1 Census sample procedure and sample for Phase 1: The quantitative phase

For this study, a census sampling approach was used for the collection of data in the quantitative phase (Phase 1). The school that is used for the case has a population of 42 educators and 1020 learners. The entire school (the case) population were surveyed. In a census sampling method, the results are reliable and accurate (Surbhi, 2017).

Data was analysed using IBM SPSS (Version 27) software. IBM SPSS was used in computing descriptive statistics and inferential statistics. Exploratory factor analysis was employed to construct a single measure for nomophobia to assess the underlying relationship between the ratings of the 28 statements in the survey. Principle component axis factoring was specified as the extraction procedure and varimax rotation method. The rotated factor matrix was presented. A two-sample t-test was performed to compare educators and learners' responses. Cronbach's alpha was calculated to determine the reliability of the items. The Pearson's correlation coefficient was used to determine the strength of the relationship between the constructs. A two-

way ANOVA was used to determine how independent variables, in combination, affect a dependent variable. Acceptability, trustworthiness, and ethical procedures were duly ensured via the approved procedures.

A well-designed questionnaire should be valid, reliable, clear, succinct and interesting. It is important to design the questionnaire based on a conceptual framework, scrutinise each question for relevance and clarity, and think of the analysis you are going to perform at the end of the day (Jenn, 2006). With this in mind, the researcher used the recommendations from Barry, Chaney, Stellefson and Chaney (2011) to develop the basic items in the questionnaire. The researcher used: uncomplicated, easy to understand wording that is appropriate for respondents' reading level; few words as necessary for the statements; completed sentences; and avoided double barrelled questions.

For this study, the researcher was also very aware of aspects to consider when designing the questionnaire (Alchemer, 2016):

- To minimise the impact of survey fatigue, the questionnaire has been designed to be completed within 10 minutes.
- To get accurate answers from respondents, the use of language that reflects how the respondents actually think is adopted.
- The researcher has no control in bias over self-reported behaviour and this is a concern for the accuracy of the results of the study.

For Phase 1 of the study, the census consists of educators *($n_1=42$*) and learners *($n_2=1020$*). Permission from the Gauteng Department of Education as well as from the Ethical Clearance Committee of the University of South Africa were sought for conducting the research. Phase 1 consists of questionnaires that were given to the teachers at the selected school, that is, 42 teachers *(n_1)*. The census sample of learners comprises of all classes from each grade from grade 8 to grade 12 in the Gauteng school that is the case. For this quantitative phase, response rates are very important for analysis.

4.6.3.2 Sampling procedure and sample for Phase 2: The qualitative phase

This study potentially conducts a survey of teachers and learners at a single school (the case) in Gauteng to explore managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. This study had two samples, the teachers at the school and the learners at the school.

The sample of teachers are made up of all levels of teachers, with different skills, and differing years of experience. The teachers are male and female participants who may speak different languages, are from a different ethnicity and different geographical locations. The learners are from grade 8 to grade 12, which includes learners of different ages. The teacher and learner population encompasses learners and teachers from mixed socio-economic status, race and gender. The emphasis of the research is on representativeness as well as in selecting cases that are information rich.

For the qualitative phase (Phase 2), a total of twenty-one participants (n=21) were interviewed. The participants for the qualitative phase of the study were made up of 15 learners (3 learners from each grade starting from grade 8 to grade 12) and 6 educators that were part of the case study. The researcher plans to undertake convenience non-probability sampling to select learners and educators at a Gauteng school that has a ban on the use of cell phones at school. Convenience sampling has the benefit of it being less costly and time consuming, has an ease of administration, usually assures a high participation rate and it is possible to generalise similar subjects (McMillan & Schumacher, 2014).

4.6.4 Summary

The summary of the educators and learners' population and the sample size drawn from the case are illustrated in Table 4. 1 as seen below.

Phase	Participants	Target Population	Actual sample size	Sampling techniques used
Quantitative Phase (Phase 1)	Educators	42	42	Census sampling method
	Learners	1020	1020	Census sampling method
	Total	1062	432	
Qualitative Phase (Phase 2)	Educators	42	6	Convenience sampling
	Learners	1020	15	Convenience sampling
	Total	1062	21	

Table 4. 1: Population and sample size of educators and learners in the case.

4.7 INSTRUMENTATION AND DATA COLLECTION

4.7.1 Introduction

Instrumentation concerns the designing and structuring of instruments or tools necessary to collect data (Miles, Huberman & Saldana, 2013). Thus, instrumentation comprises specific methods for collecting data and assists a researcher to get information that is required to answer the research question. Tests, questionnaires, non-cognitive measures, interviews and observations are often used to collect quantitative data. Observations, interviews, documents, artefact collection and other supplementary techniques are often used to collect qualitative data (McMillan & Schumacher, 2014).

Data collection involves following the case study protocol, using multiple sources of evidence, creating a case study database (the database was not presented but was stored safely, as it was too large to include in the presentation of the results), and maintaining a chain of evidence (Yin, 2014). Miles et al., (2013) similarly recommend that multiple sources of evidence should be used, that a case study database should be used to store relevant evidence, and that an auditable chain of evidence (also referred to as an 'audit trail') should explain how any conclusions have been drawn. According to Yin (2014), case studies collect direct evidence. Furthermore, in case studies, data are analysed as they become available, and the emerging results are used to shape the next set of observations, or the next data collection activity.

In addition to investigator bias that may result from personal values and assumptions, and which can unduly influence data collection and analysis, potential effects of the investigator on the behaviour of the case study participants also need to be taken into consideration (Darke et al., 1998, Baskarada, 2014). For instance, "double hermeneutics" refers to the situation where researchers influence the interpretations of the study participants (Baskarada, 2014). Arguments that such type of bias may be minimised by building rapport between the investigators and the participants (Miles et al., 2013) are questionable. In this study, the researcher explicitly acknowledges any such aspects and critically reflects on how meanings may have been socially constructed.

A case study database allows investigators to develop an audit trail from data collection, through analysis, to final conclusions. According to Yin (2014), any interested reader should be able to link the conclusions presented in the case study report to the underlying analyses, the supporting evidence, the case study protocol, and the original research questions. A case study database may include interview transcripts, investigator notes, documentary evidence, preliminary analyses, and the like. As such, the use of a case study database enhances the reliability of the study. All items in the database should be categorised, indexed, and cross-referenced in order to facilitate easy retrieval.

Before data collection is completed, researchers should ensure they have collected enough confirmatory evidence for most of the main study topics, and that the evidence included attempts to investigate major rival hypotheses or explanations. According to Yin (2014), any case study findings are likely to be more convincing and accurate if [they] are based on several different sources of information. Baskarada (2014) states that the selection of appropriate instances/cases, triangulation, and the search for disproving evidence are the key features of case studies.

In this mixed-methods single case study research (MMSCR) that uses an explanatory sequential research design, the interviewer uses questionnaires for the quantitative phase (phase 1) and semi-structured interviews for the qualitative phase (phase 2).

4.7.2 Instrumentation and data collection for Phase 1: The quantitative phase

For many good reasons, the questionnaire is the most widely used tool for obtaining information from subjects. A questionnaire is relatively economical (compared to a schedule, interview or observation), has the same questions for all subjects, and can ensure anonymity. Questionnaires can include statements (to which respondents can specify to what degree they agree or disagree with the statement) or questions, but in all cases, the subject is responding to something written for specific purposes. The researcher has carefully considered whether a new questionnaire should be developed. The researcher has opted to use an existing questionnaire that was to be adapted. Quantitative data are collected by adapting the Nomophobia Questionnaire (NMP-Q) (Yildirim & Correia, 2015) which uses scaled items. McMillan and Schumacher (2014) attest to the fact that an instrument with established reliability and validity, saves time and money.

Based on the results of the reliability analysis, the internal consistency coefficient, Cronbach's alpha, for all the items in the NMPQ was .945. Cronbach's alpha values for the four dimensions n (i.e., not being able to communicate, losing connectedness, not being able to access information and giving up convenience) were .939, .874, .827, and .814, respectively. Thus, the study conducted by Yildiram and Correia (2015) empirically supports that the NMP-Q demonstrates good internal consistency, and that the NMP-Q generates reliable scores (Yildiram & Correia, 2015).

The NMP-Q consists of 20 scaled items that cover four main dimensions of nomophobia: not being able to communicate, losing connectedness, not being able to access information, and giving up convenience. Each item is measured by a 7-point Likert scale, with 1 being “strongly disagree” and with 7 being “strongly agree.” The questionnaire has closed form items which obtain demographic information and data that can be categorised easily. The closed form questions provided categories and ask the respondent to check the appropriate box. The scaled questionnaire was exclusively designed for obtaining details and opinions about the participants perception of his/her personal mobile phone use. The scaled questionnaire has been adapted by the researcher to determine how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The quantitative survey tool has been adapted by including Section A (Demographic information of participant), Section C (participant’s perception on the quality of teaching), Section D (participant’s perception on the quality of learning) and Section E (Managing the impact of nomophobia). The questionnaire comprises five sections as illustrated in Table 4. 2 below:

Section	Types of questions
A	Demographic
B	Nomophobia test
C	Quality of teaching
D	Quality of learning
E	Managing the impact of nomophobia

Table 4. 2: Sections in questionnaire and types of questions

The scaled questionnaire for educators and learners is attached as Annexure A.

The data collection in the quantitative phase involves two stages, namely, the pilot study stage and the main study stage. Creswell (2014) indicates that a pilot study is used as a field test in establishing the content validity of the instrument and for improving formats, questions, and scales. The researcher had people who are knowledgeable of the content area review the initial item pool to determine each item’s clarity and its relevance to the construct/ content area being measured (DeVellis, 2003; Dillman, 2007). The underlying rationale for eliciting expert feedback concerns

"maximizing item appropriateness" and examining the extent to which proposed items cover all potential dimensions (DeVellis, 2003, p50). Experts can also provide insight to alternative ways of measuring the phenomena that were not operationalized. In this stage investigators are seeking to finalize substantive content of the scale (Dillman, 2007).

Cognitive interviewing determines whether respondents understand each item as intended and whether questions can be accurately answered (Forsyth & Lessler, 1991). According to Dilllman (2007, p.141), the cognitive interviewing process provides insight into the following questions:

- *Are all the words understood?*
- *Are all the questions interpreted similarly by all respondents?*
- *Do all the questions have an answer that can be marked by every respondent?* (Dillman, 2007, p141).

Cognitive interviewing consists of an individual participant reading through a scale in the presence of an interviewer, and 'thinking out loud' (e.g., "I'm not sure how to answer," "None of these responses apply to me") as they proceed. The researcher probes the respondent in order to get a better understanding of how each question is being interpreted and whether the intent of the question is being realized (Dillman, 2007; Barry et al., 2011)

The pilot study enabled the researcher to make any modifications, if necessary, before distributing the questionnaires to learners and teachers in a Gauteng school (the case) where the use of cell phones is banned. The pilot study was tested on five teachers and ten learners (two per grade from grade 8 to grade 12). The sample of subjects in the pilot test had characteristics similar to those that were used in the study. The pilot test respondents were given space to write comments about individual items and the questionnaire as a whole. The researcher determined from the pilot test if items were clear or if the questionnaire was too long (McMillan & Schumacher, 2014). After distribution, the final questionnaire was then completed and used for the main study stage – which would represent the entire sample of the quantitative phase.

4.7.3 Instrumentation and data collection for Phase 2: The qualitative phase

In qualitative research, it is important to understand that the human as researcher, is the primary collection instrument (Creswell, 2013; Key, 1997; Merriam & Tisdell, 2015). Thus, qualitative researchers mention amongst other characteristics, the researcher as key instrument as a characteristic of qualitative research. Additionally, Creswell (2013) when defining qualitative research indicates that the qualitative researcher builds a complex holistic picture, analyses words and reports detailed views of informants as the study proceeds. In this study, the researcher was the key, primary or active instrument/tool that designs, collects and analyses data and reports on the data. This allows the researcher to have full control of the study by responding to the contextual environment through maximisation of opportunities for collecting and producing meaningful information (Merriam & Tisdell, 2015).

However, Bogdan and Biklen (2007) and Merriam and Tisdell (2015) warn that being the primary human instrument in the qualitative research may introduce biases, subjectivity and observer effects in data collection, analysis and reporting. This would adversely affect the quality of the study results. The researcher would, however, avoid or reduce the biases, subjectivity and observer effects by being sensitive to the context and data, and practising ethical measures and good communication skills during the proceedings of the qualitative study (Bogdan & Biklen, 2007; Merriam & Tisdell, 2015).

Thus, it is important for the researcher to focus on developing skills as a case study investigator, training for a specific case study, developing a case study protocol, conducting a pilot case, and gaining any relevant approvals (Yin, 2014). Preparation should also aim to identify any relevant issues in the case study design and/or the team composition, and endeavour to address any such issues before starting the data collection stage. Before proceeding further, the researcher should also reach an agreement with the case study organisation/participants regarding any limitations on the disclosure of data, identities, and findings (Darke et al., 1998). Potential participants should also be informed about the research timeframe, the proposed nature of their involvement, and the expected practical outcomes.

For Phase 2, a total of twenty-one participants (n=21) were interviewed. The 21 participants for the qualitative phase of the study are made up of 15 learners (3 learners each from grade 8 to grade 12) and 6 teachers that are in Gauteng schools where the use of cell phones is banned. To find answers to the main research question and sub-questions, a total of 21 participants are selected. These participants are drawn from the selected case which is a Gauteng school where the use of cell phones is banned. The researcher has foremost the literature study of managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

The researcher conducted face to face semi-structured interviews with the participants to elaborate on the quantitative data of views and thoughts regarding the management of the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The objective of the qualitative phase is to collect narrative data on strategies that enhances the knowledge of learner and educator nomophobia and managing the impact of this on the quality of teaching and learning. During interview sessions, an audio-tape recorder was used as this aids the researcher in transcribing and coding data during data analysis. The researcher asked permission of the respondents before using the recording device. Qualitative data was analysed later for occurring themes.

The researcher interviewed the respondents using open-ended questions to gain insight into their beliefs, ideas, opinions and views regarding the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Phase 2 enabled the researcher to gather qualitative data to elucidate matters in finer detail and to add meaning to the quantitative results. This allowed for an in-depth understanding of the sub-questions posed in this study. This detailed understanding led to the designing of a framework for managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Interviews are guided conversations that are usually one of the most important sources of case study evidence (Yin, 2014). However, *"they should only be used to obtain information that cannot be obtained in any other way"* (Darke et al., 1998, p. 283 in Baskarada, 2014). Interviews can be structured, semi-structured, or unstructured (Baskarada,2014):

- **Structured interviews** involve asking pre-defined questions, with a limited set of response categories. The responses are coded by the interviewer based on an already established coding scheme (Miles et al., 2013), thus being somewhat similar to written surveys.
- **Semi-structured interviews, or focused interviews** can be more flexible and allow the researcher to better understand the perspective of the interviewees (Daymon & Holloway, 2002). In semi-structured interviews, a researcher is able to refocus the questions, or prompt for more information, if something interesting or novel emerges (Dane, 2010).
- **Unstructured interviews**, on the other hand, do not impose any predefined answer categories (Fontana & Frey, 1994). They utilise open-ended questions, thus allowing for even more flexibility. While such interviews are least efficient, they may generate rich data and uncover surprising/unexpected evidence (Daymon & Holloway, 2002).

This study used semi-structured interviews to collect information rich data from educators and learners whose schools have banned the use of mobile phones to gain an understanding of how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The researcher makes use of a semi-structured interview schedule for educators (Annexure G) and a separate semi-structured interview schedule for learners (Annexure H).

Interview questions focus on experiences or behaviours, opinions and values, feelings, knowledge, sensory perceptions, and the individual's background or demographic information (McMillan & Schumacher, 2014). Qualitative interviewing requires truly open-ended questions. Dichotomous response questions, which elicit yes/no answers or short phrases in response should be avoided. When these occur, the interview assumes an interrogative rather than a conversational tone. It is recommended that interviewers use probes and pauses, be genuine, maintain eye contact, and convey that the researcher hears and connects with the person to establish trust and elicit more valid data, instead of using a more rigid approach. The experience of an interviewer with regard to technique and subject matter expertise is a key factor in identifying and

maximising the collection of relevant information. This study follows Kasunic's (2010) interview process as shown in Table 4. 3.

Orientation	Introductions and exchange of contact details. Description of the study and the interview process. Clarification of any expectations regarding non-attribution, sharing of data, and any other issues.
Information Gathering	The interviewer uses a questionnaire to guide the interview and to record responses.
Closing	The interviewer reviews the key points, any issues, and/or action items, and confirms accuracy with the respondent. The interviewee is invited to provide feedback on the interview process. The interviewer thanks the interviewee and seeks permission for any future contact.

Table 4. 3: Interview process, adapted from Kasunic, 2010

Some common pitfalls that can threaten an effective interview include misinterpretation/misunderstanding of questions and answers (perhaps due to personal prejudices or convictions), leading/loaded questions and interjecting comments that can bias the response, listening only to what is easy to understand, and making assumptions about what the interviewee may answer based on prior responses. Furthermore, it has been observed that posing of *why* questions may create defensiveness on the part of the interviewees, and that *how* questions are usually a better choice (Yin, 2014).

Additionally, as interviewees may be biased, have poor recall, or poor articulation, it is usually necessary to corroborate such data with information from other sources. For instance, Yin argues that interviewing people with different perspectives can be a valuable approach. If possible, views of individuals from all relevant sections of the organisation should be obtained, and the views of more senior officials should not be given greater weight than views of less highly placed persons (Eisenhardt & Graebner, 2007; Baskarada, 2014). Interviewees themselves may also suggest other persons to interview, or other sources of evidence that may be of interest (Yin, 2014).

Any interview questionnaire used should include topic areas that address important issues; however, interviewers should preferably not read the questions but memorise the first few and refer to the instrument only occasionally (Kasunic, 2010). Interviewers

should use eye contact and a confident manner to set the tone for the interview and help establish rapport with the respondent. When tempted to omit a question because they think they already know the answer, interviewers should confirm their assumptions with the interviewee. Also, when an answer is too brief or vague, the interviewer should try to elicit more detail. This can be done by employing the silent probe (i.e., pause and wait), using overt encouragement (e.g., saying “uh-huh” or “okay”), asking for elaboration, asking for clarification, repetition (verify understanding by paraphrasing interviewee responses), and so on (Kasunic, 2010).

Using recording devices is a matter of personal preference. However, most interview methodologists do not think that mechanised recording is a good idea as recording may make interviewees uncomfortable as well as introduce additional transcription and analysis related complications (Yin, 2014). For instance, in the case where the recording device malfunctions and the interviewers haven’t been taking notes, the whole interview (or series of interviews) may be lost. Additionally, respondents may struggle to say things in a socially acceptable way (Kasunic, 2010). As complete transcription and analysis of recorded interviews can be expensive and very time consuming, it may be argued that conducting more non-recorded interviews instead could be a more productive approach (Walsham, 2006). McMillan and Schumacher (2014) on the other hand, say that the primary data of qualitative interviews are verbatim accounts of what transpires in the interview session. Thus, tape or digital recording the interview ensures completeness of the verbal interaction and provides material for reliability checks. This study makes use of a digital device to record the interviews and the researcher also makes notes. The researcher transcribes verbatim the collected data from the interviews and attaches the participants’ non-verbal expressions to the corresponding words, phrases or sentences. The transcription is qualitatively analysed. The purpose of this analysis is to make sense of the massive data collected in the investigation.

In order to bring the interview to closure, the interviewer reviews any actions and issues that were identified during the meeting. Upon the completion of the interview, the researcher completes and types the handwritten records or transcribes the tape. The interviewer also reviews the interview transcript and annotates it as needed (e.g.,

abbreviations, incomplete thoughts, etc.) (Kasunic, 2010). Any clarifications should be followed up with the interviewees as soon as possible.

Participant-observation refers to a special kind of observation where the investigator is not purely a passive observer, but an active participant in the events being studied (e.g., when the investigator is a staff member in the organisation being studied) (Yin, 2014). However, participant-observations can be biased as the investigator is not an independent party. Also, such observers may find it difficult to think 'outside of the box' and, as such, adopting a novel perspective may be challenging.

Informed consent was obtained from all the educators participating in the quantitative phase (Phase 1) and the qualitative phase (Phase 2) see Annexure D. Dooly et al., (2017) say that in the case of research carried out with children under the age of 18 and which is in collaboration with schools, the education centre will provide parental consent for research to be carried out in the centre. Therefore, permission will not have to be sought from parents of learners who are under eighteen years of age. The principal of the school grants permission for the minors to participate in the interviews. However, the researcher feels it is necessary to obtain the relevant permission from the parents. Permission from participants was sought to make use of an audiotape during the interview sessions. The participants were made aware that their participation in this study is voluntary and that they could withdraw from the study without penalty. Information gathered from the participants is kept highly confidential. All the participants are given alpha-numeric pseudonyms to ensure anonymity, e.g., Teacher A; Teacher B and Teacher F (for teachers) and Learner 01; Learner 02 and Learner 15 (for learners).

4.7.4 Data processing

The preceding paragraphs concentrated on the collection of data from the case, a school in Gauteng, by using questionnaires for the quantitative phase (Phase 1) and semi structured face to face interviews for the qualitative phase (Phase 2). However, Richards (2005) remarks that researchers need to goad data into saying things because they [data] do not speak for themselves. Researchers do this by conducting data processing in their studies. Data processing, through data analysis, makes sense

of the collected data and finally finds an answer or answers to the research question (Merriam & Tisdell, 2015; McMillan & Schumacher, 2014).

Data processing in the quantitative phase (Phase 1) and the qualitative phase (Phase 2) consists of interwoven and integrally related processes of data recording and management, analysis and interpretation (Marshall & Rossman, 2016; Miles et al., 2013). This implies that there are no firm boundaries between them (Miles et al., 2013). However, in this study, the researcher discusses them as separate processes to show their central importance in the investigation on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

4.7.5 Data recording and management

For the quantitative phase (Phase 1) of the study and the qualitative phase (Phase 2) of the study mounds of data were collected on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The researcher manually and electronically recorded and managed this data for analysis and report writing. Miles et al. (2013) advice researchers to put in place careful data management plans for them to arrive at genuine data analysis and writing. Thus, data management aims at organising and making data easily retrievable and manipulatable (Marshall & Rossman, 2016) to align those [data] towards the solutions of the research problem. The data for the quantitative phase (Phase 1) was recorded and managed by the researcher by familiarising herself with the appropriate software (SPSS) and entering the participant's responses manually into an MS-Excel file.

Before the analysing process, the researcher would clean, code and organize the data. For this study, data validation is used in MS-Excel to negate wrong and double entry. Data cleaning is the process of detecting and correcting (or removing) corrupt or inaccurate records from a record set, table, or database and refers to identifying incomplete, incorrect, inaccurate or irrelevant parts of the data and then replacing, modifying, or deleting the dirty or coarse data (Wu, 2013). The researcher ensured that coding is consistent in order not to affect the validity of the analysis of results. The closed-ended questions are assigned numbers according to the demographics of the

participants and in accordance with their perceptions of the statements to be answered on the Likert scale which were used to generate descriptive and inferential statistics.

Through a manual approach, the researcher transcribed the interviews, code/index and categorise data segments (McMillan & Schumacher, 2014; Marshall & Rossman, 2016; Miles et al., 2013). The electronic approach is mainly for typing, formatting, saving, creating backups and printing hard copies of the manually transcribed data. The researcher safely stored the questionnaires (from the quantitative phase – Phase 1) and the study notes and transcripts (from the qualitative phase – phase 2), hard copies and backups for future references and data verification. In this way, the researcher is convinced that the collected information on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools will be safely preserved.

4.8 DATA ANALYSIS

4.8.1 Introduction

The analyse stage relies on theoretical propositions and other strategies, considers and employs analytic techniques, explores rival explanations, and displays data (facts) apart from interpretations (Yin, 2014). Bogdan and Biklen (2007) view data analysis as working with data, organising it, breaking it into manageable units, synthesising it, searching for patterns, discovering what is important and what is to be learned, and deciding what one will tell others. Since this is a mixed methods case study with a sequential explanatory design, the data analysis for the quantitative phase (Phase 1) and the qualitative phase (Phase 2) was done separately.

Quantitative data analysis is all about analysing number-based data (which includes categorical and numerical data) using various statistical techniques. McMillan and Schumacher (2014, p. 163) define statistics as "*…methods of organising and analysing quantitative data. These methods are tools designed to help the researcher organise and interpret numbers derived from measuring a trait or variable."*

The two main branches of statistics are descriptive statistics and inferential statistics. Descriptive statistics transform a set of numbers or observations into indices that

describe or characterise the data. Descriptive statistics (sometimes referred to as summary statistics) are thus used to summarize, organize and reduce large numbers of observations (McMillan & Schumacher, 2014). Usually, the reduction results in a few numbers derived from mathematical formulas to represent all observations in each group of interest. Descriptive statistics focus on 'what is' with respect to the sample data. In this study, descriptive statistics focuses on what is the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The use of descriptive statistics is the most fundamental way to summarize data, and it is indispensable in interpreting the results of quantitative research (Creswell, 2014).

The researcher has chosen tick boxes for the demographic variables and a 7-point Likert type scale for the nomophobia test and the perception of the quality of teaching and learning, as measurement of this type assumes that categories of the variable can theoretically be rank ordered from highest to lowest (McMillan & Schumacher, 2014). Each value can thus be related to others as being equal to, greater than or less than. In other words, there is an inherent order to the categories. In this study, a Likert type scale allows participants to choose from 'strongly agree with' to 'strongly disagree with'.

Inferential statistics, on the other hand, are used to make inferences or predictions about the similarity of a sample to the population from which the sample is drawn. Because many research questions require the estimation of population characteristics from an available sample of subjects or behaviour, inferential statistics are commonly used in reporting results. Inferential statistics depend on descriptive statistics. Without a complete understanding of descriptive statistics, therefore, inferential statistics make very little sense.

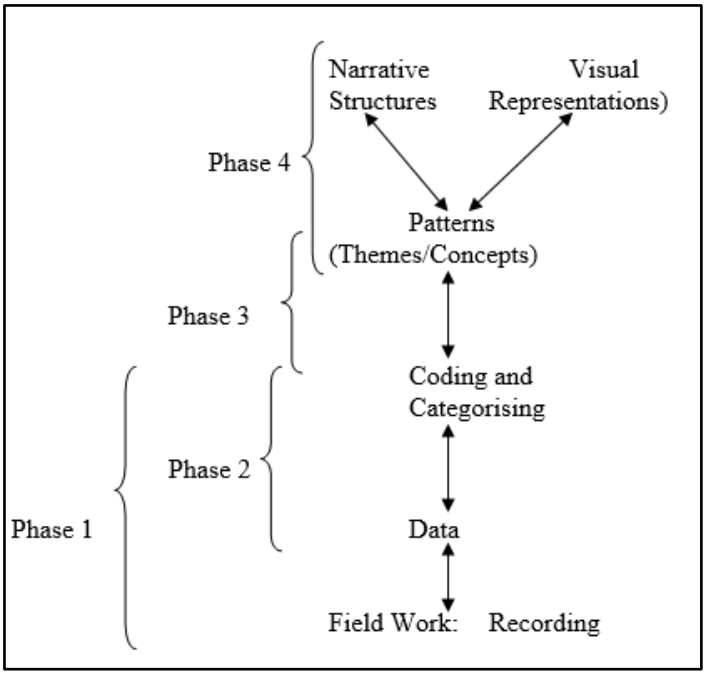
Miles et al. (2013) succinctly regards qualitative data analysis as consisting of three concurrent flows of activity: data reduction (i.e., selecting, focusing, simplifying, abstracting, and transforming the data), data display (organising, and compressing data), and conclusion drawing/verification (drawing conclusions from verified data). Other qualitative researchers distance themselves from defining qualitative data analysis but instead give its purpose and objectives. For example, Bogdan and Biklen (2007), and Rossman (2016) state that data analysis is the *process* of bringing order,

structure and meaning to the mass of collected data. Glesne and Peshkin (1992) state that data analysis involves organising what one has seen, heard, and read so that one can make sense of what one has learned.

Creswell (2013) believes that this process of data analysis and interpretation can best be represented in as a spiral image – the data analysis spiral. Marshall and Rossman (2016) vehemently believe that qualitative data analysis must not proceed in linear form. Thus, McMillan and Schumacher (2014) state that data analysis is an ongoing, cyclical process that is integrated into all phases of qualitative research. These authors divide the process of data analysis into interim and inductive data analysis and give the general process of inductive data analysis as in Figure 4.2. This figure illustrates the interdependence of inductive analytic phases and also shows the data analysis process beginning at the first stage of data collection (i.e., recording in the field) and ending with narrative and/or visual data presentation.

McMillan and Schumacher (2014) add that interim data analysis occurs during data collection when making data collection decisions and identifying recurring topics/codes. Researchers carry out the processes of data coding and categorisation, after the completion of data collection, through inductive data analysis. Merriam and Tisdell (2015) adds that data analysis becomes more intensive as the study progresses, and once all the data are in.

Figure 4. 2: General process of inductive data analysis, adapted from McMillan & Schumacher (2014)



Consequently, the researcher conducts data analysis during and after data collection, and optimise inductive data analysis only when all data from the selected school is in. This approach to data analysis assists the researcher to investigate how the sampled school within Gauteng can manage the impact of nomophobia on the quality of teaching and learning.

Creswell (2013) maintains that there are different data analysis forms inherent in each of the five traditions of qualitative inquiry (namely biography, phenomenology, ground theory, ethnography and case study). This author says that a qualitative case study researcher may analyse data by making a detailed description of the case and setting, seeking a collection of instances from the data through categorical aggregation, looking and drawing meaning from a single instance through direct interpretation, establishing patterns or developing naturalistic generalisations. In this study, the researcher uses a combination of these data analysis forms to analyse and gather rich findings on how the selected school in Gauteng can manage the impact of nomophobia on the quality of teaching and learning.

4.8.2 Data analysis in Phase 1: The quantitative phase

The quantitative survey tool comprised of four sections. Section A focused on demographic information of participant, Section B focused on the participants nomophobia test, Section C focused on the participant's perception on the quality of teaching, Section D focused on the participant's perception on the quality of learning and the last Section E focused on managing the impact of nomophobia on the quality of teaching and learning.

The analysis of the quantitative data includes the following:

- Descriptive statistics pertaining to the quantitative respondents from Section A of the questionnaire. The descriptive statistics provide an overview of the details of the respondents that took part in the quantitative survey.
- Inferential statistics are statistical techniques used to explore univariant, bivariant and multivariant statistics.

Section A from the questionnaire provides demographic information of the participants. The score derived from section B of the questionnaire give an interpretation of the participants level of nomophobia. The score for the nomophobia test is calculated by adding the scores of all the items in Section B for each participant. The score from section B and its interpretation are illustrated in Table 4. 4 below.

Score	Interpretation
20	Absence of nomophobia
21-59	Mild level of nomophobia
60-99	Moderate level of nomophobia
100-140	Severe nomophobia

Table 4. 4: Scores for levels of nomophobia

Organising data involves the explaining of inferential statistics in detail. Measures of frequency and central tendency (mean) are used to describe data obtained from the questionnaires. For the inferential statistics, conclusions are derived from the use of correlation and analysis of variance (ANOVA).

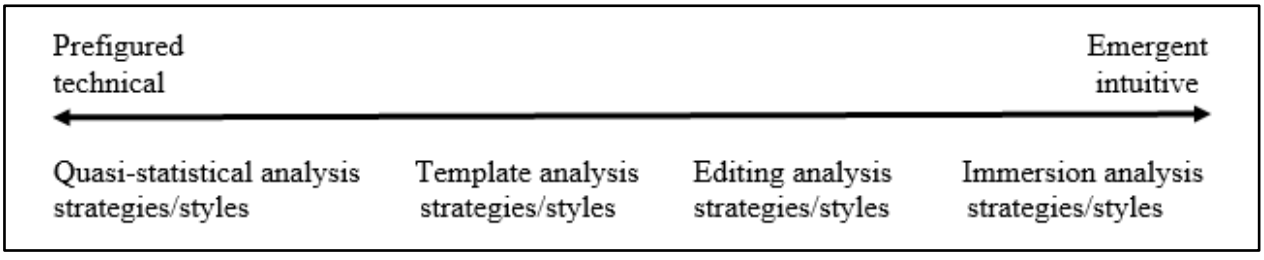
4.8.3 Data analysis in Phase 2: The qualitative phase

The researcher conducted one-on-one semi-structured interviews with 21 selected participants. These participants (made up of 15 learners and 6 teachers) were called upon to elaborate on perceptions of learners and teachers with regard to managing the impact of nomophobia on the quality of teaching and learning. All the participants were given alpha-numeric pseudonyms to ensure anonymity, e.g., Teacher A; Teacher B and Teacher F (for teachers) and Learner 01; Learner 05 and Learner 13 (for learners). The researcher retained an accurate, confidential list of participants' names yet, for the purposes of the study, the use of alpha-numeric pseudonyms was utilized in order to free the participants from identification and possible victimization or persecution. During the individual interview sessions, an audio-tape recorder was used. This aided the researcher in transcribing and coding data during data analysis.

Creswell (2013) presents and discusses three analysis strategies in qualitative inquiry. First is a general review of all information, often in the form of jotting down notes in the margins of text (e.g., observational fieldnotes, interview transcriptions, and notes about photographs or videotapes). Second is the reduction of data to develop codes or categories and to sort text or visual images into categories. Finally comes making preliminary counts of data and determining how frequently codes appear in the database.

However, Marshall and Rossman (2016) give a continuum of [qualitative] analysis strategies (figure 3.2) and posit that nearly as many analysis strategies exist as qualitative researchers, implying that qualitative analysis strategies are numerous and non-exhaustive. Thus, McMillan and Schumacher (2014) remark that qualitative researchers develop analytical styles, but rarely make explicit all of their data analysis strategies. Figure 4.3 shows a continuum of idealised analytic styles from prefigured technical to emergent (McMillan & Schumacher, 2014; Marshall & Rossman, 2016).

Figure 4. 3: Continuum of Analytic Styles adapted from Mc Millan & Schumacher (2014)



The prefigured technical/quasi data analysis styles are technical, scientific and standardised and are on the extreme left of the continuum. A researcher who analyses data through these means assumes an objectivist approach to the research and does stipulate categories in advance. On the extreme right of the continuum are the emergent/intuitive analytic styles in which categories are not predetermined. The template and editing analysis strategies stand along the continuum, with the template processes more prefigured and stipulative than the editing processes (McMillan & Schumacher, 2014; Marshall & Rossman, 2016).

Marshall and Rossman (2016) give seven typical procedures through which these data analysis strategies/styles could be utilised to answer the research problem. These procedures are organising the data, immersion in the data, generating categories and themes, coding the data, offering the interpretations through analytic memos, searching for alternative understandings and writing a report or other format for presenting the study. For the purposes of this case study, the researcher discusses data reduction together with data organisation, data coding/indexing, categories and themes generation, data interpretation and reporting.

Data reduction is the process of selecting, focusing, simplifying, abstracting, and transforming the [voluminous qualitative] data that appear in written-up field notes or transcriptions into manageable chunks (Miles et al., 2013; Marshall & Rossman, 2016). It is a part of data analysis that occurs continuously throughout a qualitative study. The researcher applies it throughout the analytic procedures in the study. In this way, the researcher tries to arrive at the right answers to the research question. Qualitative researchers engage in a data reduction process to pick up relevant data, to tell a

sensible story, and to bring meaning and insight to the responses of the participants in the inquiry.

Richards (2015) describes qualitative data reduction as a process that unfolds through three stages. The first stage occurs in the research event (i.e., during data collection) when the researcher decides what to record, note or remember. The second stage is during the making of the record when deciding what to transcribe. The third is during data analysis when off-topic or irrelevant information is discarded. The data reduction process is important in data organisation as well as in other data analysis procedures.

The organisation of data in the study was informed by the research question, interview guide, study literature, researcher's experiences managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools, and the gathered data (McMillan & Schumacher, 2014). The gathered data was organised manually and electronically as discussed under 3.4.5. In the study, the researcher logs the types of data according to the participants (i.e., teachers or learners), age (i.e., the different grades from grade 8 to grade 12), dates and times (Marshall & Rossman 2016). Well-organised data are imperative in this mixed methods research as they render vital information retrievable during the ongoing process of data analysis. The researcher makes use of codes to organise and make data retrievable.

Miles et al. (2013) state that coding is analysis through which codes are attached to *chunks* of varying size-words, phrases, sentences, or whole paragraphs, connected or unconnected to a specific setting. Thus, Marshall and Rossman (2016) regard coding data as the formal representation of analytic thinking. However, McMillan and Schumacher (2014) maintain that the descriptive name for the subject matter or topic is called the code. Put in simpler terms, codes are tags or labels for assigning units of meaning to the descriptive or inferential information compiled during a study. Marshall and Rossman (2016) and Merriam and Tisdell (2015) state that codes may be in the form of abbreviations of key words, coloured dots, numbers or a combination of these. Words as used here include phrases, letters, sentences and paragraphs in the transcriptions of an interview. Thus, in this study, the researcher regards codes as

tags/labels that attach meaning to the informants' words found in the transcriptions of the interview.

Codes are classified as descriptive, interpretive or pattern (Miles et al., 2013). Descriptive codes entail little interpretation as compared with interpretive codes, and pattern codes are more inferential and explanatory. Researchers use pattern codes to bring together lots of material into more meaningful units of analysis, thereby identifying emergent themes or explanations. Miles et al. (2013) advise qualitative researchers to create a start list of codes prior to fieldwork, revise codes, conduct checking-code (where two researchers code the same data), create operational codes, and finally to regard coding as an ongoing analytic process. In this study, the coded data serves as a base for generating categories (i.e., categorising the various chunks), so that the researcher can cluster the segments relating to the research problem.

The researcher generates categories and themes through reading and re-reading of the data – the text and noting patterns expressed or used by participants (Marshall & Rossman, 2016). McMillan and Schumacher (2014) maintain that generation of categories forces the researcher to think with analytic depth and to search for what people really mean, regardless of the terms they use. The identified categories would become buckets or baskets into which segments of text are placed. Furthermore, they will be internally consistent and distinct from one another.

Marshall and Rossman (2016) note that generating categories becomes more difficult, complex, ambiguous, creative and fun for researchers that rely on editing or immersion data analytic strategies. McMillan and Schumacher (2014) advise researchers to ask basic questions when engaged in generation of categories. Basic questions are those that begin with who, what, when, where, how and why. This approach to generation of categories obliges the researcher to analyse segments of text, compare the data with similar or improbable situations, and to treat all pieces of information as important to the study.

4.8.4 Summary

For the quantitative phase (Phase 1) of this study, the Statistical Package for Social Sciences (SPSS) computer software was used to analyse the data. The closed-ended questions were assigned numbers and the statements were assigned numbers based on a 7-point Likert scale. This data was captured via the SPSS computer program. Descriptive statistics and multivariate analysis are employed to interpret and present the data. For the qualitative phase (Phase 2) of this case study, the researcher applies both template and editing strategies to conduct data analysis. This approach allowed the researcher to use both predetermined and non-predetermined categories during the ongoing process of data analysis.

4.9 DATA PRESENTATION

4.9.1 Introduction

Creswell (2013) says that a final step in data analysis involves making an interpretation or meaning of data. Marshall and Rossman (2016) add that interpretation of data, often referred to as 'telling the story', follows the analytic processes of categorisation and coding of data. Data interpretation brings meaning and coherence to the descriptive and inferential statistics (Quantitative phase - Phase 1) and the themes, patterns and categories (Qualitative phase - Phase 2), developing linkages (triangulation between the two phases) and a story that makes sense and is engaging to read. This implies that to attach significance to what was found, making sense of the findings, offering explanations, drawing conclusions, extrapolating lessons, making inferences, considering meanings, and otherwise imposing order, the researcher has to read and re-read the data (Marshall & Rossman 2016). Part of interpretation is evaluating the data for their usefulness and centrality. Thus, Creswell (2013) notes that when researchers use a theoretical lens, they can form interpretations that call for action agendas for reform and change. In this study on managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools, the interpretation of the data could inform the policy makers on the importance of taking cognisance of the effect of nomophobia on the quality of teaching and learning in the education sector.

In this study, the research design directs that data collection begins with a rigorous quantitative research phase followed by purposive sampling in the second phase which utilized the qualitative approach (Creswell, 2014).

4.9.2 Data presentation in Phase 1: The quantitative phase

In Phase 1 of this study, once data had been collected through the use of questionnaires, the IBM SPSS software is used to capture, analyse and interpret the data. The quantitative data are presented using tables, graphs and statistical numbers (Creswell, 2013; McMillan & Schumacher, 2014).

4.9.3 Data presentation in Phase 2: The qualitative phase

In the qualitative phase, the researcher conducts face-to-face semi-structured interviews. Face-to-face interviews promote cooperation and bonding (Maree, 2019), which helps to generate more meaningful data. The researcher uses the interview format to obtain data on participants' meanings, how individuals conceive their world and how they make sense of important things in their lives (McMillan & Schumacher, 2014; Maree, 2019). The participants are required to provide rich information needed for the study on open-ended questions asked in connection with managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

This phase involves organizing and preparing the data for analysis, reading through all transcripts as many times as possible for better understanding. Then follows the coding process in which texts are separated into meaningful segments to represent a category of meaning. During coding, the researcher codes the data based on emerging information. Codes are allocated to categories of text that emerge as similar in meaning to each other. These codes are labelled, and the segmented text are arranged according to their codes. Themes are then generated and described. After that, the researcher recalls the results of the quantitative phase and the findings obtained from the interviews. This is done in narrative and an exact description of the events in the transcripts are given (McMillan & Schumacher, 2014; Creswell, 2014). The qualitative data is presented using selected quotes that are poignant and/or most representative

of the research findings. The setting and speakers are established in the text at the end of the quote.

Qualitative researchers may use: first, categorical aggregation to seek a collection of instances from the data, hoping that issue-relevant meanings will emerge; second, direct interpretation to look at a single instance and draw meaning from it without looking for multiple instances: third, establishing patterns to look for correspondence between two categories; fourth, developing naturalistic generalisations to draw generalisation from the case either for themselves or for applying it to a population of cases; and lastly, detailed description to develop generalisations about the case in terms of the patterns and how they compare and contrast with published literature on the same topic in different sites (Creswell, 2014).

Creswell (2014) maintains that interpretation in qualitative research can take many forms, be adapted for different types of designs, and be flexible to convey personal, research-based, and action meanings. For example, Creswell (2013) lists and discusses five different forms of data analysis that may be applied in a case study. These forms are direct interpretation, establishing patterns, naturalistic generalisations and description of the case.

In this single-site mixed methods case study research (MMSCR), the researcher opted to use direct interpretation, detailed description, and naturalistic generalisations to interpret data gathered from the selected school. In the study, the instance is how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The three opted forms of analysis enables the researcher to make sense of the data in two broad ways: first by drawing meanings from a single instance, comparing and contrasting the results with those found in studied literature, and second by drawing generalisations from which the provincial and national government can be informed on how the Gauteng department of education should manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

Creswell (2013) states that the final step in data analysis involves making an interpretation or meaning of the data. This then implies that data analysis ends with data interpretation. This contradicts Richards (2015), Marshall and Rossman (2016),

and Bogdan and Biklen (2007), who maintain that data analysis continues into data reporting or writing through data interpretation. For example, Bogdan and Biklen (2007), and Richards (2015) state in categorical terms that analysis and interpretation continue into the writing stage through which researchers refine and justify analysis. Marshall and Rossman (2016) add that writing about qualitative data cannot be separated from the analytic process. Thus, in this study, the researcher continues with data analysis throughout the writing up of the intended dissertation.

From the results and findings obtained, the researcher infers the lessons learned in managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The final step is the triangulation of the data which will be examined in the next paragraph.

4.9.4 Triangulation of the data from the two phases

Saunders et al (2019) argue that triangulation is not just the use of different data collection techniques but also, as Flick (2018) concur, the assemblage of multiple perspectives and views from different individuals. Hence, triangulation may be viewed, as the way of capturing a multiplicity of voices and truths to the topic, in opposition to just using the one right result. When the researcher simultaneously gathers both quantitative and qualitative data, merges them using both quantitative and qualitative data analysis, and then interprets the results together, it can provide a better understanding of the phenomenon of interest. When the results of different methods converge and support one another, researchers have triangulated the findings. This allows for a stronger overall design and more credible conclusions (McMillan & Schumacher, 2014; Creswell, 2014).

In this study, the views and perspectives from two different samples (in Phase 1 and Phase 2 respectively) are used for triangulation purposes by comparing the findings from the two samples. Once themes are identified from the data, triangulation is employed between the themes identified from the distinct data sources. In practice, this means that the themes derived from the quantitative analysis in Phase 1 are triangulated with themes drawn from the semi-structured interviews in Phase 2 (the

qualitative phase). The purpose here is to ensure consistency as well as distinctions between the themes.

4.9.5 Summary

The researcher believes that the choice of the explanatory, sequential research design for this study would greatly aid in achieving triangulation by employing a pluralistic approach in which, as purported by McMillan and Schumacher (2014), one method will complement and compensate for the weaknesses of the other via sequential processing.

4.10 TRUSTWORTHINESS OF THE STUDY

4.10.1 Introduction

Trustworthiness is what makes it rational for people to accept research findings - to build future research upon them, to utilize them to inform public policy, and to use them to guide individual choice and community action. Trustworthiness or rigor of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Polit & Beck, 2014). Credibility of the study, or the confidence in the truth of the study and therefore the findings, is the most important criterion (Polit & Beck, 2014).

4.10.2 Validity and reliability of the quantitative data – Phase 1

For quantitative researchers, the methods used to establish trustworthiness include validity and reliability. Validity is defined as the extent to which a concept is accurately measured in a quantitative study. Validity is important for this study because it determines what survey questions to use and helps ensure that the researcher is using questions that truly measure the issues of importance. There are three major types of validity. The first category is content validity. This category looks at whether the instrument adequately covers all the content that it should with respect to the variable. In other words, does the instrument cover the entire domain related to the variable, or construct it was designed to measure (Heale & Twycross, 2015)?

A subset of content validity is face validity, where experts are asked their opinion about whether an instrument measures the concept intended. Construct validity refers to whether you can draw inferences about test scores related to the concept being studied. For example, if a person has a high score on the survey that measures nomophobia, does this person truly have a high degree of nomophobia (heale & Twycross, 2015)?

There are three types of evidence that can be used to demonstrate a research instrument has construct validity (Heale & Twycross, 2015):

- Homogeneity - meaning that the instrument measures one construct.
- Convergence - this occurs when the instrument measures concepts similar to that of other instruments. Although if there are no similar instruments available this will not be possible to do.
- Theory evidence - this is evident when behaviour is similar to theoretical propositions of the construct measured in the instrument. For example, when an instrument measures nomophobia, one would expect to see that participants who score high on the instrument for nomophobia also demonstrate symptoms of anxiety in their day-to-day lives.

This implies that validity deals with the appropriateness of the methods (i.e., methods for collecting, analysing and interpreting data) (McMillan & Schumacher, 2014). The validity of managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools is considered to be the degree to which it measures what it claims to measure.

A concern that often arises for quantitative researchers is common method bias. Common method bias (CMB) happens when variations in responses are caused by the instrument rather than the actual predispositions of the respondents that the instrument attempts to uncover. In other words, the instrument introduces a bias, hence variances, which the researcher was analysing. To overcome this, the researcher adds a time delay, increasing the physical separation of items, and/or adding a cover story to deemphasize any association between the independent and dependent variables,

which reduces a participants' tendency to use previous answers to inform subsequent answers (De Vries, 2015).

Reliability is concerned with demonstrating that same results can be obtained by repeating the data collection procedure (McMillan & Schumacher, 2014). In other words, other investigators should in principle be able to follow the same procedures and arrive at the same results.). Reliability relates to the consistency of a measure. A participant completing an instrument meant to measure nomophobia should have approximately the same responses each time the test is completed.

Although it is not possible to give an exact calculation of reliability, an estimate of reliability can be achieved through different measures. The attribute of reliability that was used in this study is Cronbach's α. Cronbach's α is the most commonly used test to determine the internal consistency of an instrument. Internal consistency assesses the correlation between multiple items in a test that are intended to measure the same construct. You can calculate internal consistency without repeating the test or involving other researchers, so it's a good way of assessing reliability when you only have one data set. In this test, the average of all correlations in every combination of split-halves is determined. Instruments with questions that have more than two responses can be used in this test. The Cronbach's α result is a number between 0 and 1. An acceptable reliability score is one that is 0.7 and higher (Heale & Twycross, 2015).

In this study, the construct of nomophobia is difficult to measure. Furthermore, the quality of teaching and learning are also difficult to measure. Hence, the scales used in the questionnaire was tested by experts to ensure that (McCrae, Kurtz, Yamagata & Terracciano, 2011):

- These scales indeed measure the unobservable construct that we wanted to measure (i.e., the scales are 'valid'), and
- They measure the intended construct consistently and precisely (i.e., the scales are 'reliable'). Reliability and validity, jointly called the 'psychometric properties' of measurement scales, are the yardsticks against which the adequacy and accuracy of our measurement procedures are evaluated in empirical research.

Researchers need to identify and explain potential threats to validity in research. McMillan and Schumacher (2014) refer to validity threats, for example history and selection, as particular events or processes that could lead to invalid research conclusions or results. Niemann (2000) refers to these particular events or processes as systematic errors that need to be avoided or eliminated or controlled or ruled out (Creswell, 2013) to validate the results.

In research, validity threats or systematic errors might be controlled or ruled through various means. Systematic errors can be minimised by improving experimental techniques, selecting better instruments and removing personal bias as far as possible. For a given set up, these errors may be estimated to a certain extent and the necessary corrections may be applied to the readings (Lavrakas, 2008). Merriam and Tisdell (2015), Niemann (2000) and McMillan and Schumacher (2014) list triangulation of methods of collecting and interpreting data, saturation of data, comparison, member checks or respondent validation and guarding against researcher bias and reactivity/reflexivity, and observance of ethical behaviour as measures/strategies to combat validity threats or systematic errors.

4.10.3 Credibility and trustworthiness of the qualitative methods - Phase 2

Credibility is the confidence that can be placed in the truth of the research findings. Credibility establishes whether the research findings represent plausible information drawn from the participants original data and is a correct interpretation of the participants original views. Credibility of the study, or the confidence in the truth of the study and therefore the findings, is the most important criterion (Polit & Beck, 2014).

Trustworthiness or rigor of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Pilot & Beck, 2014). In addition to credibility and trustworthiness, data quality is also a key validity criterion. Research has identified a range of relevant data quality dimensions, including accuracy, objectivity, believability, reputation, interpretability, ease of understanding, concise and consistent representation, relevancy, value-added, timeliness, completeness, amount of information, accessibility, and access security (Wang &

Strong, 1996; Baskarada, 2014). In relation to these dimensions, data may become corrupted during collection, transmission, storage, integration, retrieval, and analysis (Baskarada, 2014).

4.10.4 Strategies for improving reliability of the quantitative methods - Phase 1

The suggestions by Kleeman (2018) to improve reliability in quantitative research are adopted in this study. The researcher uses enough questions to assess competence. A sensible balance to avoid questionnaires being too long, was to use 4-6 questions per objective. It must be reiterated that reliability increases with test length. For the results to be consistent, it's important that the test environment is consistent – the researcher tried to ensure that all participants have the same amount of time to take the test in and have a similar environment. Ensure participants are familiar with the assessment user interface. If a participant is new to the user interface or the question types, then they may not show their true competence due to the unfamiliarity. It's common to provide practice tests to participants to allow them to become familiar with the assessment user interface. This can also reduce test anxiety which also influences reliability. The researcher measured reliability by calculating 'Cronbach's Alpha' which measures internal consistency reliability (the higher it is, the better).

4.10.5 Strategies for improving trustworthiness of the qualitative phase - Phase 2

Key (1997) and Morse et. al (2015) list strategies for establishing the trustworthiness of research as credibility, transferability, dependability and confirmability. Miles et al. (2013) add that trustworthy results are also replicable, reliable, reasonable, probably true, significant, accurate, compelling, precise, legitimate, non-biased and empowering. This indicates that it is not easy for researchers to obtain trustworthiness of results in a study. However, researchers do take appropriate measures throughout their studies to ensure the trustworthiness of their results.

In this study, the researcher employs ethical behaviour, triangulation, comparison, mechanisation and minimisation of researcher bias to ensure the trustworthiness of the

study results. The researcher is fully confident that the use of these techniques in data collection and analysis makes the results reliable and valid (Merriam & Tisdell, 2015; McMillan & Schumacher, 2014), thereby making them trustworthy.

4.10.5.1 Ethical behaviour

Merriam and Tisdell (2015) maintain that ethical behaviour in quantitative and qualitative studies is important to protect the identity and privacy of the participants but is also important for the promotion of researcher-participant relationship. Good researcher-participant relationship builds up mutual trust between researcher and participants and, more importantly, enhances validity and reliability of qualitative results (McMillan & Schumacher, 2014). Merriam and Tisdell (2015) show that establishing validity and reliability brings about trustworthiness of the results. Thus, the researcher conducted the study in an ethical manner in an attempt to establish trustworthiness of study results.

4.10.5.2 Triangulation

McMillan and Schumacher (2014), describe triangulation as a way of collecting research data from different sources and settings, and analysing the same data by applying different analytical techniques. For example, in this study, the author uses both quantitative (Phase 1) and qualitative (Phase 2) research methods to ensure trustworthiness of findings.

4.10.5.3 Comparison

In this single site mixed methods case study, the researcher plans to collect data from one Gauteng school (the case). Data was collected from educators and learners to determine how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The analysis of these data brings about results that are either similar or different. The researcher compares them to highlight possible commonalities and differences amongst the results (Richards, 2015). However, the researcher considers all study findings and results equally important and not discard the less frequent ones (Richards, 2015). The difference in results prompts the

researcher to confirm the findings with participants, thereby making the emerging results more confirmable. Richards (2015) and McMillan and Schumacher (2014) refer to the confirmation of results with participants as '*member checking* or *respondent validation'*. Thus, the use of member checking or respondent validation ensures the trustworthiness of the study results (Key, 1997).

4.10.5.4 Mechanisation

In this study, mechanisation refers to the use of a digital device to capture the voices and essence of the informants. Tape recorders provide accurate and relatively complete records (McMillan & Schumacher, 2014). In this study, a digital device (viz. Huawei cell phone) was used during the face-to-face interviews, to capture the voices of teachers and learners at the selected Gauteng school (the case). This ensures the correctness or credibility of the data. The captured data was transcribed verbatim and analysed. The researcher revisits the voices on the cell phone during data analysis should there be a feeling that the transcript or part thereof does not express the anxiety or other emotions heard during the interview (Richards, 2015). This confirms the captured responses of participants and finally promotes the trustworthiness of the study results.

4.10.5.5 Researcher bias

McMillan and Schumacher (2014) state that researcher bias is what researchers bring to the research from their own background and identity. According to this view, researcher bias poses threats to a research design and thus needs to be eliminated. In opposition to this traditional view, Glesne and Peshkin (1992) postulate that researcher bias is valuable for research in forming a study basis. These two views of researcher bias are applicable to this research design.

The knowledge and experience gathered and gained through the literature review by the researcher, who is the primary research instrument, about how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools, poses a threat to the research design. Firstly, from the literature review, the researcher learned that the impact of mobile phone use in classrooms is both advantageous and

disadvantageous in schools. Secondly, the researcher is a teacher at a Gauteng school where mobile phones are banned in classrooms. This may introduce researcher bias into the research design that, if not controlled, might affect the study results adversely.

These two possible negative effects of researcher bias, if not controlled, will reduce the trustworthiness of the study results. These effects of researcher bias were reduced by applying mechanisation and probes during the face-to-face interview with the interviewees and employing data analytic strategies.

4.10.6 Summary

Niemann (2000) states that both qualitative and quantitative researchers can determine the degree of validity by asking the following question: '*Are the researchers really measuring or observing what they think they are and to what degree have the findings also been tested or refined by other research?'* This is applicable to the mixed methods single case study research (MMSCR) design on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. Creswell (2013) describes [qualitative] validity as a strength of qualitative research and is used to determine whether the research findings are accurate from the standpoint of the researcher, the participant, or the readers of an account (i.e., consumers of the research). Validity in qualitative research, refers to the degree of congruence between the explanations of the phenomena and the realities of the world (McMillan & Schumacher, 2014). In this mixed methods case-study, the researcher regards the use of verification strategies as a way of attaining, enhancing and maintaining reliability and validity (Phase1) and trustworthiness and credibility (Phase 2). The researcher attains rigor by being creative, flexible, sensitive and skilful in applying the set research design. This approach allows the researcher to use research methods coherently, select appropriate samples, collect and analyse data concurrently, reconfirm ideas from data in new data and develop theory during the course of the research to establish reliability and validity of the study (Morse et al., 2015).

The researcher limits random errors by triangulating data, in order to strengthen the validity of evaluation data and findings, the researcher collects data through two

sources: questionnaires (Phase 1) and interviews (Phase 2). Gathering data through one technique can be questionable, biased and weak. However, collecting information from a variety of sources and with a variety of techniques can confirm findings. Therefore, if we obtain the same results, we can become sure that the data are valid. Certainly, through triangulation we can gain qualitative and quantitative data in order to corroborate our findings.

4.11 ETHICAL ISSUES RELATED TO THE STUDY

In order to collect data for a mixed methods single case study research project, the intention of the researcher is to get an in-depth account of the phenomenon which may require the participants to talk about their private experiences. This implies that trust is very crucial between the participants and the researcher. The following are ethical issues that McMillan and Schumacher (2014) suggest a qualitative researcher should anticipate and as such this study acknowledges:

4.11.1 Informed consent as a dialogue

This study followed the protocol of informed consent that had to be signed by each participant. The researcher explained the time required for participation and the non-interfering; non-judgemental role of the researcher was explained to participants (McMillan & Schumacher, 2014).

4.11.2 Confidentiality and anonymity

The researcher made every effort so that the settings and participants should not be identifiable in print. Thus, the locations and features of settings were disguised and the study used code names of people and places (McMillan & Schumacher, 2014).

4.11.3 Privacy and empowerment

Deception violates informed consent and privacy. The researcher negotiated with participants so that they understand the power they have in the research process (McMillan & Schumacher,2014). Creswell (2013) talks about voluntary participation,

which enables the participant to withdraw from the study at any time and also their right to refuse to participate.

4.11.4 Caring and fairness

Although this study will not result in physical harm to informants, some persons may experience embarrassment when they realise that they are indeed nomophobic. Justifying the possible harm to one individual because it may help others is unacceptable. A sense of caring and fairness was part of the researcher's thinking, actions and personal morality (McMillan & Schumacher, 2014). This was achieved in this study by engaging in open discussions and negotiation with participants.

Permission to conduct the research was requested from the Gauteng Department of Education (Annexure B) and the principal of the school, the case (Annexure C) of the selected school. An ethical clearance certificate was requested from the university (Annexure I). The educator participants were requested to sign a consent form giving permission for their participation (Annexure D). Since this study involves minors under the age of eighteen, the parental consent letter (Annexure E) and the learner assent form (Annexure F) were signed by the respective parents and learners.

4.12 CONCLUSION

This chapter discussed the research design and methods necessary to investigate how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The adopted research design is a specific and highly flexible explanatory single site mixed methods case study design that will point the researcher towards the collection of relevant and rich data (Yin, 2014).

Central to the description of the study research design was data collection and data processing methods that are essential to answer the research question. The chapter explains the study will be conducted in two phases: the quantitative phase (Phase 1) and the qualitative phase (Phase 2). A census sampling approach was used for the quantitative phase (Phase 1) and purposeful sampling was used for the qualitative phase (Phase 2) of the study. These were used to gather the experiences of teachers

and learners on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The chapter further indicates that in this study, data collection and data processing (for Phase 1 and Phase 2) were conducted in a manner that ensures trustworthiness of the emerging study results. Finally, the chapter states that data analysis (for Phase 1 and Phase 2) continues into the writing up of the dissertation (Marshall & Rossman, 2016).

In the next chapter, the researcher will present the quantitative data (Phase 1) which is the first part of the explanatory sequential mixed methods design chosen for this particular study. The data was presented, analysed and interpreted in line with the study on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF QUANTITATIVE RESULTS

5.1 INTRODUCTION

The previous chapter, chapter four, discussed the research design and methods necessary to investigate how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The adopted research design is a specific and highly flexible explanatory single site mixed methods case study design that will point the researcher towards the collection of relevant and rich data (Yin, 2014).

Central to the description of the study research design was data collection and data processing methods that are essential to answer the research question. The chapter explains the study will be conducted in two phases: the quantitative phase (Phase 1) and the qualitative phase (Phase 2). A census sampling approach was used for the quantitative phase (Phase 1) and purposeful sampling was used for the qualitative phase (Phase 2) of the study. These were used to gather the experiences of teachers and learners on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. The chapter further indicates that in this study, data collection and data processing (for Phase 1 and Phase 2) were conducted in a manner that ensures trustworthiness of the emerging study results.

This study set out to investigate managing the impact of nomophobia on the quality of teaching and learning in a public, secondary Gauteng school (the case). Furthermore, the school has a ban on the use of mobile phones in the classroom. To do this, the study has to answer the research problems and realise the study objectives through the utilisation of appropriate research design and methods.

To help provide an answer to the fundamental research question, the following secondary research questions or sub-questions were developed:

- What is nomophobia and how can it be overcome?
- Do teachers and learners in the Gauteng school (the case) perceive themselves to suffer from nomophobia and to what extent?
- In which manner or way do teachers and learners perceive that nomophobia affects the quality of teaching and learning in the Gauteng school (the case)?
- How can the negative impact of nomophobia on teaching and learning in Gauteng classrooms be managed effectively?

The main purpose or aim of this study is to determine how the impact or effect of nomophobia, encountered by teachers and learners in Gauteng schools, could be managed effectively to improve the quality of teaching and learning. The sub-aims or objectives of the study are to:

- Define and describe the concept of nomophobia and how it can be overcome.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the teachers' and learners' perceptions of the impact or extent of nomophobia on the quality of teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on the quality of teaching and learning in Gauteng schools can be managed effectively.

Primary quantitative data for this study were collected through a survey that was conducted amongst a sample of educators and learners within the case (A secondary public school in Gauteng). A total of 620 valid questionnaires were received and analysed. The results are presented and discussed in this chapter. The chapter is divided into seven main sections, of which this is the first.

Section 5.2 presents the sample profile in relation to demographic characteristics of respondents. Educators had to respond to the highest qualification attained and learners had to say in which grade they are.

Section 5.3 reports respondents' perceptions on whether they suffer from nomophobia and to what extent. This addresses the second research objective. The first research objective has been dealt with in Chapter 2, the literature review.

Section 5.4 presents the results pertaining to respondents' perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning. These sections address the third research objective.

Section 5.5 considers the respondents' perception on whether distractions caused by mobile phones can be controlled in the classroom. This section addresses the fourth research objective.

Section 5.6 and 5.7 investigates the statistical relationship between perceptions of nomophobia and the quality of teaching and learning. Furthermore, these sections determine the statistical relationship between the perceptions of nomophobia and managing the impact of mobile phone use in the classroom. These sections address the main research question. Table 5. 1 lists the acronyms used in this chapter for ease of reading and understanding.

Acronym	Construct
NMP-Q	Nomophobia questionnaire
NMP-Q-sum	Nomophobia questionnaire sum
MP-QoT	Mobile phones and the quality of teaching
MP-QoL	Mobile phones and the quality of learning
MI-MPU	Managing the impact of mobile phones use

Table 5. 1: Acronyms used for constructs.

5.2 SAMPLE CHARACTERISTICS

Below, the characteristics of the sample are presented in terms of the demographics of educators and learners.

5.2.1 Biographical profile of subjects in the study

The demographic profile of the sample in relation to characteristics for educators such as gender, age, and highest level of education is reported in this section. Furthermore, the demographics for learners such as gender, age and grade in school is also reported in this section. Past studies have indicated that certain demographic factors play a role in explaining variation in levels of perception of nomophobia and its impact on the quality of teaching and learning (Davie & Hilber, 2017; Gezgin et al., 2018).

Table 5.2 reports the proportional distribution of respondents according to gender, age and level of education. The table further gives a breakdown of whether respondents are educators and learners. Some respondents, albeit minimal, did not engage with the survey and others submitted empty cases. The non-responses were considered random and negligible given the large sample size. These non-responses were excluded from reporting.

Table 5.2 shows that this study aligns with a study conducted by Davids (2018) who says that female teachers make up about 68% of the country's teaching force, but only 36% of principals are women. The percentage of female teacher respondents in this study are 69,7%.

			ARE YOU AN EDUCATOR OR LEARNER?		
			Educator	Learner	Total
GENDER	Male	N	10	249	259
		%	30,3%	42,4%	41,8%
	Female	N	23	338	361
		%	69,7%	57,6%	58,2%
	Total	N	33	587	620
		%	100,0%	100,0%	100,0%
DO YOU OWN A MOBILE PHONE?	Yes	N	33	546	579
		%	100,0%	93,0%	93,4%
	No	N		41	41
		%		7,0%	6,6%
	Total	N	33	587	620
		%	100,0%	100,0%	100,0%
HIGHEST EDUCATIONAL QUALIFICATION (Educators only)	Grade 12	N	1		1
		%	3,0%		3,0%
	Diploma	N	6		6
		%	18,2%		18,2%
	UG Degree	N	16		16
		%	48,5%		48,5%
	PG Honours	N	7		7
		%	21,2%		21,2%
	UG Masters	N	1		1
		%	3,0%		3,0%
	PG Doctorate	N	2		2
		%	6,1%		6,1%
	Total	N	33		33
		%	100,0%		100,0%
CURRENT GRADE IN SCHOOL (Learners only)	Grade 8	N		101	101
		%		17,2%	17,2%
	Grade 9	N		118	118
		%		20,1%	20,1%
	Grade 10	N		119	119
		%		20,3%	20,3%
	Grade 11	N		158	158
		%		26,9%	26,9%
	Grade 12	N		91	91
		%		15,5%	15,5%
	Total	N		587	587
		%		100,0%	100,0%

Table 5. 2: Biographical profile of subjects in the study

5.2.2 Descriptive statistics of the age variable

Table 5. *3* gives a report of the descriptive statistics which are brief descriptive coefficients that summarize the given data set of the sample. Descriptive statistics were broken down into measures of central tendency and measures of variability (spread)

Report – age in years											
ARE YOU AN EDUCATOR OR LEARNER?	Mean	Std. Deviation	Median	Std. Error of Mean	Minimum	Maximum	Kurtosis	Std. Error of Kurtosis	Skewness	Std. Error of Skewness	N
Educator	42,4	10,72	43	1,87	24	64	-0,92	0,798	0,03	0,409	33
Learner	15,5	1,61	16	0,07	12	20	-0,67	0,201	0,09	0,101	587
Total	17,0	6,70	16	0,27	12	64	20,57	0,196	4,41	0,098	620

Table 5. 3: Descriptive statistics of respondents' age

A univariate analysis was conducted on the continuous variable of age. Table 5. 3 shows the results of the analysis. Educator respondents ages subscribed to The Teaching and Learning International Survey published in July 2019 which found that the average age of the South African teacher was 43 years. The survey also found that 32% of teachers were aged 50 and above. This means that in the next decade almost half of the current teaching workforce will have to be replaced (Maphalala & Mpofu, 2019). The results of this study revealed that information from 33 educators, ranged in age from 24 to 64 years (M=42.4, SD=10,72).

5.3 MEASURING RESPONDENTS' LEVELS OF NOMOPHOBIA (RESEARCH OBJECTIVE 2)

This section relates to the second research objective, namely, to measure respondents' perceptions on whether they suffer from nomophobia and to what extent. Respondents were asked to rate 20 statements pertaining to their perception on their personal mobile phone usage. A seven-point Likert-type scale was used to rate the statements, where 1 = strongly disagree, 2 = disagree, 3 = partially disagree, 4 = neutral, 5 = partially agree, 6 = agree and 7 = strongly agree. Higher levels of agreement with a statement would be associated with higher levels of mobile phone usage, while disagreement would be associated with less or no mobile phone usage.

Table 5. 4 reports the percentage of educators and Table 5. 5 reports the percentage of learners who responded, “strongly disagree”, “disagree”, “partially disagree”, “neutral”, “partially agree”, “agree” and “strongly agree” to the various statements. The mean and standard deviation (SD) scores are also reported, providing a sense of the extent of agreement and dispersion of ratings around the mean. To further makes sense of the ratings, the scores for “strongly disagree”, “disagree” and “partially disagree” were combined and classified as “disagree” for reporting purposes. Similarly, the scores for “partially agree”, “agree” and “strongly agree” were combined and classified as “agree”.

There is a substantial difference between adult and adolescent thinking. Adult thinking differs in three ways from adolescent thinking: Practical, cognitive flexibility and dialectical thinking. Adults have more flexibility in their thought patterns, understanding that there are multiple opinions on issues, and that there is more than one way to approach a problem. Furthermore, the difference between young adolescents and adult reasoning is particularly obvious when it involves reasoning requiring the conjunction of emotion and logic (Icenogle et al., 2019). The researcher thus feels it is necessary to differentiate between the responses of educators and learners. The results that are presented show the responses of educators and learners separately.

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box	
										Disagree	Agree
I would feel uncomfortable without constant access to information through my mobile phone	4,67	1,744	3,0%	15,2%	9,1%	9,1%	24,2%	27,3%	12,1%	27,3%	63,6%
I would be annoyed if I could not look for information on my mobile phone when I wanted to	5,30	1,468	0,0%	9,1%	3,0%	12,1%	18,2%	39,4%	18,2%	12,1%	75,8%
Being unable to get the news (e.g., happenings, weather, etc) on my mobile phone would make me nervous	4,61	1,819	6,1%	12,1%	9,1%	12,1%	24,2%	21,2%	15,2%	27,3%	60,6%
I would be annoyed if I could not use my mobile phone or its capabilities when I wanted to do so	5,39	1,749	6,1%	6,1%	0,0%	6,1%	27,3%	21,2%	33,3%	12,1%	81,8%
Running out of battery in my mobile phone would scare me	4,12	1,916	15,2%	12,1%	6,1%	12,1%	27,3%	21,2%	6,1%	33,3%	54,5%
If I were to run out of credits or hit my monthly data limit, I would panic	3,21	1,728	24,2%	18,2%	6,1%	24,2%	18,2%	9,1%	0,0%	48,5%	27,3%
If I did not have a data signal or could not connect to WIFI then I would constantly need to see if I had a signal or could find a WIFI network	3,85	1,922	9,1%	30,3%	3,0%	15,2%	15,2%	21,2%	6,1%	42,4%	42,4%
If I could not use my mobile phone, I would be afraid of getting stranded somewhere	4,73	1,807	3,0%	9,1%	18,2%	12,1%	21,2%	12,1%	24,2%	30,3%	57,6%
If I could not check my mobile phone for a while, I would have a desire to check it	4,33	1,882	12,1%	9,1%	6,1%	24,2%	12,1%	27,3%	9,1%	27,3%	48,5%
If I did not have my mobile phone with me, I would feel anxious because I could not instantly communicate with my family/friends	4,91	1,893	6,1%	12,1%	6,1%	6,1%	21,2%	27,3%	21,2%	24,2%	69,7%
If I did not have my mobile phone with me, I would be worried because my family/friends could not reach me	5,48	1,439	3,0%	0,0%	6,1%	12,1%	21,2%	30,3%	27,3%	9,1%	78,8%
If I did not have my mobile phone with me, I would feel nervous because I would not be able to receive text messages and calls	4,76	1,768	6,1%	6,1%	12,1%	15,2%	21,2%	21,2%	18,2%	24,2%	60,6%
If I did not have my mobile phone with me, I would be anxious because I could not keep in touch with family/friends	4,97	1,686	6,1%	6,1%	3,0%	12,1%	36,4%	15,2%	21,2%	15,2%	72,7%
If I did not have my mobile phone with me, I would be nervous because I could not know if someone had tried to get a hold of me	4,82	1,685	6,1%	6,1%	9,1%	9,1%	33,3%	21,2%	15,2%	21,2%	69,7%
If I did not have my mobile phone with me, I would feel anxious because my constant connection with my family/friends would be broken	4,73	1,606	3,0%	9,1%	9,1%	18,2%	24,2%	24,2%	12,1%	21,2%	60,6%
If I did not have my mobile phone with me, I would be nervous because I would be disconnected from my online identity	3,12	1,691	18,2%	27,3%	15,2%	18,2%	6,1%	15,2%	0,0%	60,6%	21,2%
If I did not have my mobile phone with me, I would be uncomfortable because I could not stay up to date with social media and online networks	3,21	1,516	12,1%	30,3%	12,1%	21,2%	18,2%	6,1%	0,0%	54,5%	24,2%
If I did not have my mobile phone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks	3,67	1,689	9,1%	24,2%	12,1%	18,2%	21,2%	12,1%	3,0%	45,5%	36,4%
If I did not have my mobile phone with me, I would feel anxious because I could not check my email messages	4,09	1,826	12,1%	18,2%	0,0%	15,2%	30,3%	21,2%	3,0%	30,3%	54,5%
If I did not have my mobile phone with me, I would feel weird because I would not know what to	3,30	2,038	27,3%	21,2%	3,0%	15,2%	15,2%	12,1%	6,1%	51,5%	33,3%

Table 5. 4: Agreement with statements about personal mobile phone usage (Educators) (n = 33)

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box	
										Disagree	Agree
I would feel uncomfortable without constant access to information through my mobile phone	4,61	1,887	7,8%	11,8%	6,1%	19,4%	12,8%	24,4%	17,7%	25,7%	54,9%
I would be annoyed if I could not look for information on my mobile phone when I wanted to	5,17	1,858	0,0%	9,1%	3,0%	12,1%	18,2%	39,4%	18,2%	19,8%	71,0%
Being unable to get the news (e.g., happenings, weather, etc) on my mobile phone would make me nervous	3,88	1,944	13,6%	19,3%	8,9%	17,7%	15,8%	13,6%	11,1%	41,7%	40,5%
I would be annoyed if I could not use my mobile phone or its capabilities when I wanted to do so	5,15	1,824	6,6%	7,2%	3,4%	13,1%	14,0%	28,6%	27,1%	17,2%	69,7%
Running out of battery in my mobile phone would scare me	3,68	2,067	17,4%	22,8%	8,9%	15,8%	8,9%	12,9%	13,3%	49,1%	35,1%
If I were to run out of credits or hit my monthly data limit, I would panic	3,72	2,112	17,5%	23,5%	8,3%	12,9%	9,7%	13,6%	14,3%	49,4%	37,6%
If I did not have a data signal or could not connect to WIFI then I would constantly need to see if I had a signal or could find a WIFI network	4,81	1,872	6,5%	10,4%	6,6%	17,2%	12,9%	24,2%	22,1%	23,5%	59,3%
If I could not use my mobile phone, I would be afraid of getting stranded somewhere	4,45	1,990	7,8%	17,7%	6,3%	17,0%	10,6%	21,5%	19,1%	31,9%	51,1%
If I could not check my mobile phone for a while, I would have a desire to check it	4,95	1,928	7,5%	10,6%	4,3%	12,3%	12,9%	27,6%	24,9%	22,3%	65,4%
If I did not have my mobile phone with me, I would feel anxious because I could not instantly communicate with my family/friends	4,60	2,049	9,5%	13,6%	6,8%	16,0%	9,5%	20,4%	24,0%	30,0%	54,0%
If I did not have my mobile phone with me, I would be worried because my family/friends could not reach me	5,14	1,841	5,5%	7,5%	6,5%	14,5%	10,4%	25,9%	29,8%	19,4%	66,1%
If I did not have my mobile phone with me, I would feel nervous because I would not be able to receive text messages and calls	4,42	1,918	9,2%	12,1%	9,5%	19,3%	14,0%	18,7%	17,2%	30,8%	49,9%
If I did not have my mobile phone with me, I would be anxious because I could not keep in touch with family/friends	4,71	1,899	8,2%	8,7%	9,2%	16,5%	13,3%	23,5%	20,6%	26,1%	57,4%
If I did not have my mobile phone with me, I would be nervous because I could not know if someone had tried to get a hold of me	4,94	1,827	6,6%	8,3%	4,9%	15,7%	15,3%	26,6%	22,5%	19,9%	64,4%
If I did not have my mobile phone with me, I would feel anxious because my constant connection with my family/friends would be broken	4,29	2,016	10,9%	16,7%	8,3%	14,0%	12,9%	21,3%	15,8%	35,9%	50,1%
If I did not have my mobile phone with me, I would be nervous because I would be disconnected from my online identity	3,66	1,978	16,5%	21,1%	11,1%	16,7%	10,6%	13,8%	10,2%	48,7%	34,6%
If I did not have my mobile phone with me, I would be uncomfortable because I could not stay up to date with social media and online networks	3,77	1,983	16,9%	17,9%	10,1%	18,1%	10,6%	17,0%	9,5%	44,8%	37,1%
If I did not have my mobile phone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks	3,88	1,924	13,5%	17,9%	11,8%	17,2%	13,8%	16,0%	9,9%	43,1%	39,7%
If I did not have my mobile phone with me, I would feel anxious because I could not check my email messages	3,53	1,960	19,8%	18,9%	12,8%	15,8%	9,7%	15,5%	7,5%	51,4%	32,7%
If I did not have my mobile phone with me, I would feel weird because I would not know what to	3,90	2,193	21,5%	15,5%	6,5%	12,9%	11,9%	15,5%	16,2%	43,4%	43,6%

Table 5. 5: Agreement with statements about personal mobile phone usage (Learners) (n = 587)

5.3.1 Respondents' agreement with the statements

On average, most of the educators and learners agreed with the statements on not being able to access information, giving up convenience and not being able to communicate. This indicates that both educators and learners require their mobile phones for access to information, not giving up on convenience and being able to communicate.

Educators were most annoyed if they could not use their mobile phones or their capabilities when they wanted to (81,8%). Educators also expressed worry that if they did not have their mobile phones with them their family/friends would not be able to reach them (78,8%). Educators were not so concerned about being disconnected from their online identity (21,2%).

Learners were most annoyed if they could not look for information on their phones when they wanted to (71,0%). Learners seemed least anxious if they could not check their email messages (32,7%).

While these statements individually provided an indication of respondents' levels of mobile phone usage, the aim was to construct a single measure for nomophobia. In order to facilitate this process, exploratory factor analysis was employed for all the respondents (n=620) and for learners (n=587) to assess the underlying relationship between the ratings of the 20 statements. The aim of this analysis was to identify the emergence of underlying hypothetical constructs and whether these related to previous factors identified in the literature. Principle component axis factoring was specified as the extraction procedure and varimax rotation method.

For all the respondents (n=620) the Kaiser-Meyer-Olkin measure of sampling adequacy revealed a value of 0.931, which indicated that the items (or statements) were factorable (Pallant, 2016). Bartlett's test of sphericity was shown to be highly significant (($\chi 2$ = (190; n = 620) = 5041.332; p = 0.000). Four factors emerged, explaining 37.026%, 8.359%, 7.283% and 5.034% respectively of the total variance. The rotated factor matrix for all respondents is presented in Table 5. 6.

For the learners (n=587) the Kaiser-Meyer-Olkin measure of sampling adequacy revealed a value of 0.930, which indicated that the items (or statements) were factorable (Pallant, 2016). Bartlett's test of sphericity was shown to be highly significant ((χ2 = (190; n = 587) = 4712,044; p = 0.000). Four factors emerged once again, explaining 36.893%, 8.237%, 7.214% and 5.356% respectively of the total variance. The rotated factor matrix for learners is presented in Table 5.7. A factor analysis was not conducted for the educators as the sample size (n=33) is considered negligible and the above two samples already show that the items (or statements) were factorable.

	Factor				Mean (SD)	
	1	2	3	4	Item	Construct
I would feel uncomfortable without constant access to information through my mobile phone	0,664				4,62(1,879)	4,70(1,328)
I would be annoyed if I could not look for information on my mobile phone when I wanted to	0,800				5,18(1,839)	
Being unable to get the news (e.g., happenings, weather, etc) on my mobile phone would make me nervous	0,237				3,92(1,943)	
I would be annoyed if I could not use my mobile phone or its capabilities when I wanted to do so	0,725				5,16(1,820)	
Running out of battery in my mobile phone would scare me		0,771			3,70 (2,060)	4,32(1,328)
If I were to run out of credits or hit my monthly data limit, I would panic		0,749			3,69(2,096)	
If I did not have a data signal or could not connect to WIFI then I would constantly need to see if I had a signal or could find a WIFI network		0,395			4,76(1,886)	
If I could not use my mobile phone, I would be afraid of getting stranded somewhere		0,459			4,47(1,980)	
If I could not check my mobile phone for a while, I would have a desire to check it		0,249			4,92(1,929)	
If I did not have my mobile phone with me, I would feel anxious because I could not instantly communicate with my family/friends			0,733		4,61(2,040)	4,68(1,511)
If I did not have my mobile phone with me, I would be worried because my family/friends could not reach me			0,797		5,16(1,822)	
If I did not have my mobile phone with me, I would feel nervous because I would not be able to receive text messages and calls			0,664		4,44(1,910)	
If I did not have my mobile phone with me, I would be anxious because I could not keep in touch with family/friends			0,784		4,72(1,888)	
If I did not have my mobile phone with me, I would be nervous because I could not know if someone had tried to get a hold of me			0,714		4,94(1,818)	
If I did not have my mobile phone with me, I would feel anxious because my constant connection with my family/friends would be broken			0,633		4,31(1,998)	
If I did not have my mobile phone with me, I would be nervous because I would be disconnected from my online identity				0,765	3,63(1,966)	3,74(1,555)
If I did not have my mobile phone with me, I would be uncomfortable because I could not stay up to date with social media and online networks				0,801	3,74(1,964)	
If I did not have my mobile phone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks				0,773	3,86(1.912)	
If I did not have my mobile phone with me, I would feel anxious because I could not check my email messages				0,661	3,56(1,956)	
If I did not have my mobile phone with me, I would feel weird because I would not know what to				0,520	3,86(2,188)	
**Cronbach Alpha*	*0.714*	*0.878*	*0.836*	*0.818*		

Table 5. 6: Rotated factor matrix – statements about mobile phone usage (all respondents) (n=620)

	Factor				Mean (SD)	
	1	2	3	4	Item	Construct
I would feel uncomfortable without constant access to information through my mobile phone	0,661				4,61(1,887)	4,70(1,328)
I would be annoyed if I could not look for information on my mobile phone when I wanted to	0,793				5,17(1,858)	
Being unable to get the news (e.g., happenings, weather, etc) on my mobile phone would make me nervous	0,178				3,88(1,944)	
I would be annoyed if I could not use my mobile phone or its capabilities when I wanted to do so	0,724				5,15(1,824)	
Running out of battery in my mobile phone would scare me		0,761			3,689(2,067)	4,31(1,360)
If I were to run out of credits or hit my monthly data limit, I would panic		0,748			3,72(2,112)	
If I did not have a data signal or could not connect to WIFI then I would constantly need to see if I had a signal or could find a WIFI network		0,364			4,81(1,872)	
If I could not use my mobile phone, I would be afraid of getting stranded somewhere		0,495			4,45(1,990)	
If I could not check my mobile phone for a while, I would have a desire to check it		0,198			4,95(1,928)	
If I did not have my mobile phone with me, I would feel anxious because I could not instantly communicate with my family/friends			0,728		4,60(2,049)	4,70(1,509)
If I did not have my mobile phone with me, I would be worried because my family/friends could not reach me			0,795		5,14(1,841)	
If I did not have my mobile phone with me, I would feel nervous because I would not be able to receive text messages and calls			0,647		4,42(1,918)	
If I did not have my mobile phone with me, I would be anxious because I could not keep in touch with family/friends			0,774		4,71(1,899)	
If I did not have my mobile phone with me, I would be nervous because I could not know if someone had tried to get a hold of me			0,719		4,94(1,827)	
If I did not have my mobile phone with me, I would feel anxious because my constant connection with my family/friends would be broken			0,621		4,29(2,016)	
If I did not have my mobile phone with me, I would be nervous because I would be disconnected from my online identity				0,763	3,66(1,978)	3,73(1,553)
If I did not have my mobile phone with me, I would be uncomfortable because I could not stay up to date with social media and online networks				0,796	3,77(1,983)	
If I did not have my mobile phone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks				0,767	3,88(1,924)	
If I did not have my mobile phone with me, I would feel anxious because I could not check my email messages				0,664	3,53(1,960)	
If I did not have my mobile phone with me, I would feel weird because I would not know what to				0,504	3,90(2,193)	
*Cronbach Alpha	*0.667*	*0.709*	*0.875*	*0.832*		

Table 5. 7: Rotated factor matrix – statements about mobile phone usage (learners) (n=587)

For all the respondents, a Cronbach's alpha value of 0.714 was calculated for the first factor (4 items), 0.878 for the second factor (5 items), 0.836 for the third factor (6 items) and 0.818 for the fourth factor (5 items). All these alpha values were higher than the minimum acceptable norm of 0.6 for internal consistency reliability (Hair et al., 2019). Given the significant percentage variation explained by the first factor (37.026%), it was retained as a measure for personal mobile phone usage.

Similarly for the learners, a Cronbach's alpha value of 0.667 was calculated for the first factor (4 items), 0.709 for the second factor (5 items), 0.875 for the third factor (6 items) and 0.832 for the fourth factor (5 items). Once again, all these alpha values were higher than the minimum acceptable norm of 0.6 for internal consistency reliability (Hair et al., 2019). Given the significant percentage variation explained by the first factor (36.893%), it was also retained as a measure for personal mobile phone usage. The rotation for all the respondents and the learners converged in 6 iterations.

The first factor corresponds with the notion of not being able to access information. The second factor encapsulated reasons linked to giving up convenience. The third factor relates to not being able to communicate and the fourth factor links to the concept of losing connectedness. These factors align with the factors identified in the literature.

5.3.2 Calculating the extent of nomophobia among respondents

The results of a univariate analysis of the constructs determined in the above section are shown in Table 5. 8 for educators and Table 5. 9 for learners. Furthermore, the scores of the items were added to determine the extent of nomophobia of respondents. In Chapter 4, the researcher gave a breakdown of the scores which determine the extent of nomophobia among respondents (see Table 4.4).

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Not being able to access information	4,992	4,531	5,454	5,047	5,250	1,697	1,303	-0,970	0,409	0,363	0,798
Giving up convenience	4,049	3,543	4,553	4,058	4,200	2,030	1,425	-0,114	0,409	-1,137	0,798
Not being able to communicate	4,994	4,425	5,464	4,982	5,167	2,149	1,466	-0,481	0,409	-0,826	0,798
Losing connectedness	3,474	2,942	4,016	3,474	3,600	2,295	1,514	-0,037	0,409	-1,100	0,798
Nomophobia questionnaire sum	87,27	79,28	95,26	87,09	88,00	507,892	22,536	-0,056	0,409	-1,024	0,798

Table 5. 8: Descriptive statistics of Educators responses to constructs from nomophobia questionnaire (n=33)

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Not being able to access information	4,703	4,600	4,811	4,767	5,000	1,765	1,329	-0,733	0,101	0,113	0,201
Giving up convenience	4,322	4,212	4,432	4,339	4,400	1,840	1,357	-0,118	0,101	-0,610	0,201
Not being able to communicate	4,682	4,560	4,804	4,735	4,833	2,286	1,512	-0,450	0,101	-0,592	0,201
Losing connectedness	3,746	3,620	3,872	3,728	3,600	2,149	1,555	0,107	0,101	-0,885	0,201
Nomophobia questionnaire sum	87,25	85,34	89,16	87,74	88,00	553,837	23,534	-0,274	0,101	-0,309	0,201

Table 5. 9: Descriptive statistics of Learners responses to constructs from nomophobia questionnaire (n=587)

Table 5. 8 and Table 5. 9 reveal that it is more important for educators to have access to information (M=4,992; SD=1,303) than it is for learners (M=4,703; SD= 1,329). Educators also find the need to communicate (M=4,994; SD=1,466) more essential than learners (M=4,682; SD=1,555). The nomophobia questionnaire sum reveals that on average educators (M=87,27; SD=22,536) and learners (M=87,25; SD=23,534) have a moderate level of nomophobia.

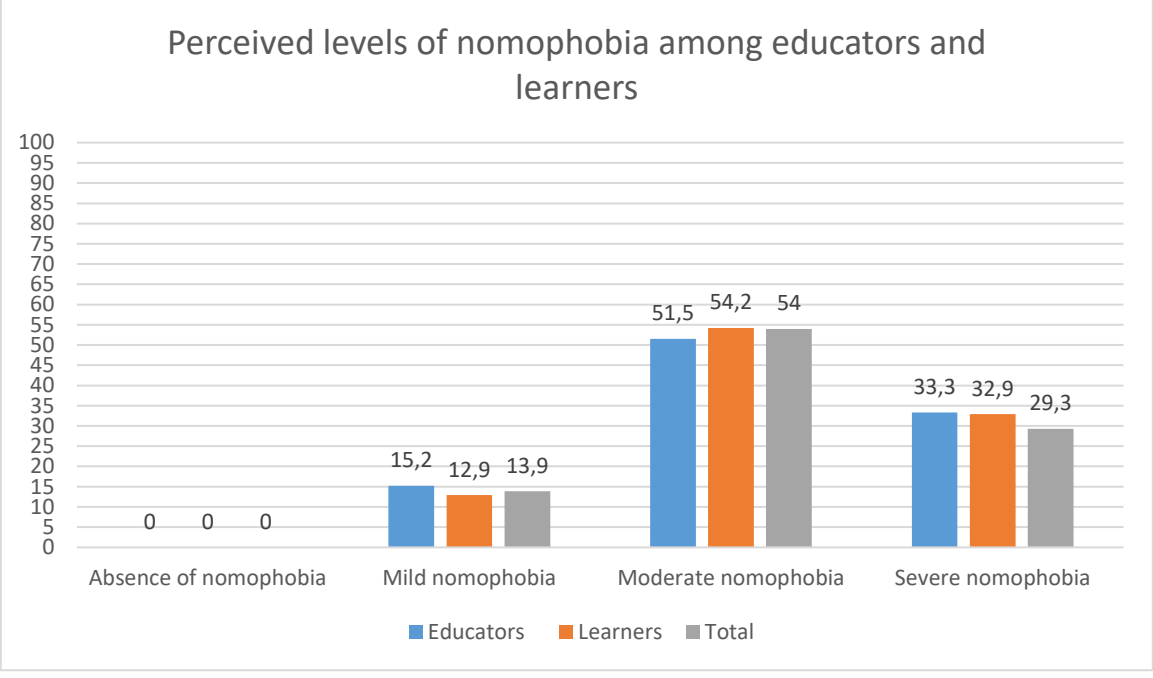
A two-sample t-test was performed to compare the level of nomophobia among educators and learners. There was not a significant difference in the levels of nomophobia between educators (M = 87.27, SD = 22.536) and learners (M = 87.25, SD = 23.534); t (618) = 0.005, p = 0,996. The results as reported indicate that nomophobia levels seemed to be consistent across educators and learners with no significant differences reported in mean levels ($p > 0.05$).

Table 5. 10 reveals the breakdown of the actual numbers and percentages of educators and learners and their levels of nomophobia as calculated. It also highlights the levels and extent of the nomophobia among educators and learners. The results are illustrated in Figure 5.1.

Score	Level of nomophobia		Educator	Learner	Total
20	Absence of nomophobia	N	0	0	0
		%	0,0%	0,0%	0,0%
		Lower 95% CL			
		Upper 95% CL			
21-59	Mild level of nomophobia	N	5	76	81
		%	15,2%	12,9%	13,1%
		Lower 95% CL	6,0%	10,4%	10,6%
		Upper 95% CL	30,1%	15,8%	15,9%
60-99	Moderate level of nomophobia	N	17	318	335
		%	51,5%	54,2%	54,0%
		Lower 95% CL	34,9%	50,1%	50,1%
		Upper 95% CL	67,8%	58,2%	57,9%
100-140	Severe nomophobia	N	11	193	204
		%	33,3%	32,9%	32,9%
		Lower 95% CL	19,2%	29,2%	29,3%
		Upper 95% CL	50,3%	36,8%	36,7%

Table 5. 10: Breakdown of extent of nomophobia among educators and learners

Figure 5. 1: Perceived levels of nomophobia among educators and learners



The global prevalence of nomophobia by severity revealed that the prevalence of moderate to severe nomophobia is 70,76%. The prevalence of severe nomophobia is approximately 21% in the general adult population (Humood et al., 2021). Interestingly in this study none (0,0%) of the respondents reported an absence of nomophobia. More educators have severe nomophobia (33,3%; 95% CL 19,2%; 50,3%) than learners (32,9%; 95% CL 29,2%; 36,8%). On average, about a third of respondents suffer from severe nomophobia (32,9%; 95% CL 29,3% ;36,7%), which is higher than the global prevalence of severe nomophobia (20,8%; 95% CL 15,45%; 27,43%).

The distribution of the summated average score for nomophobia is shown in Figure 5.2 (for educators) and Figure 5.3 (for learners). For educators, a mean of 87,27 was reported, with a standard deviation of 22,536, while a mean of 87,25 and a standard deviation of 25,534 were reported for learners. It is therefore evident from these statistics and the histogram that respondents generally reported a moderate level of nomophobia.

Figure 5. 2: Distribution of summated average score for nomophobia (Educators) (n = 33)

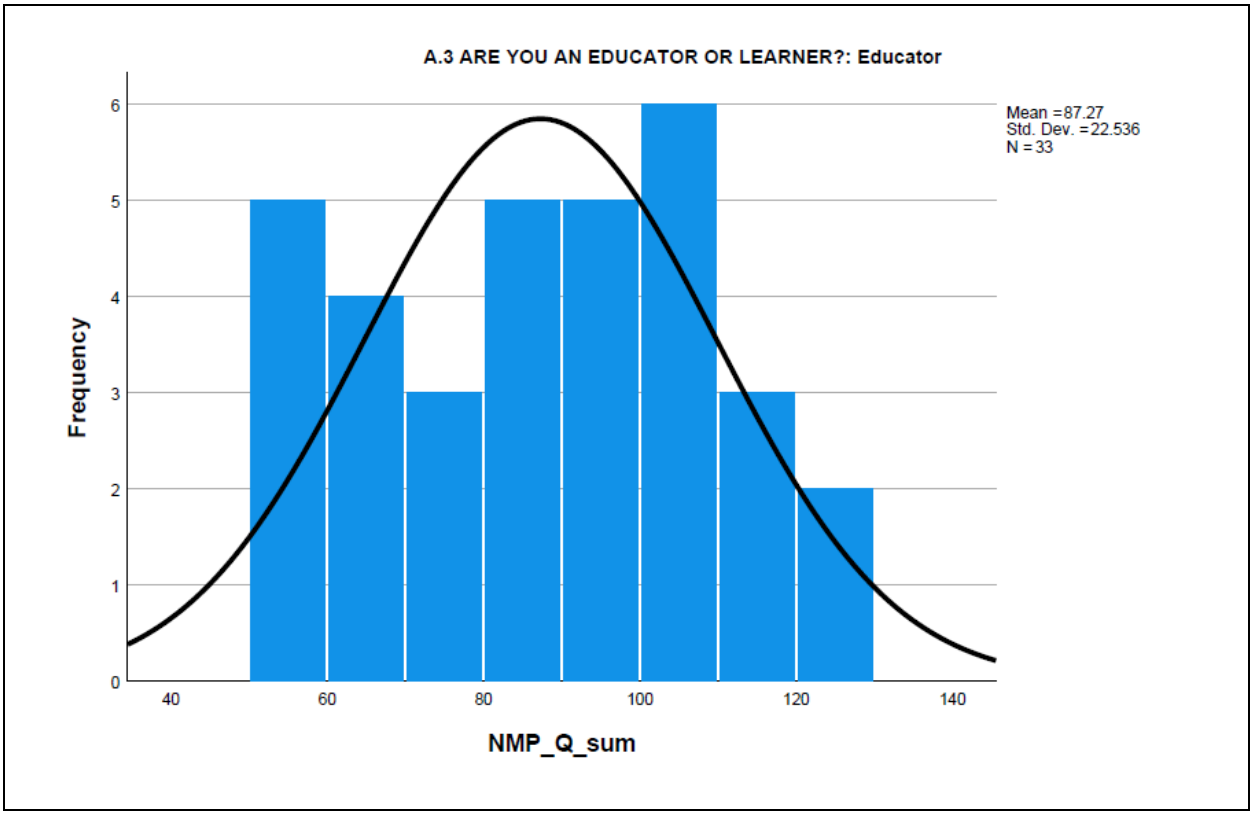
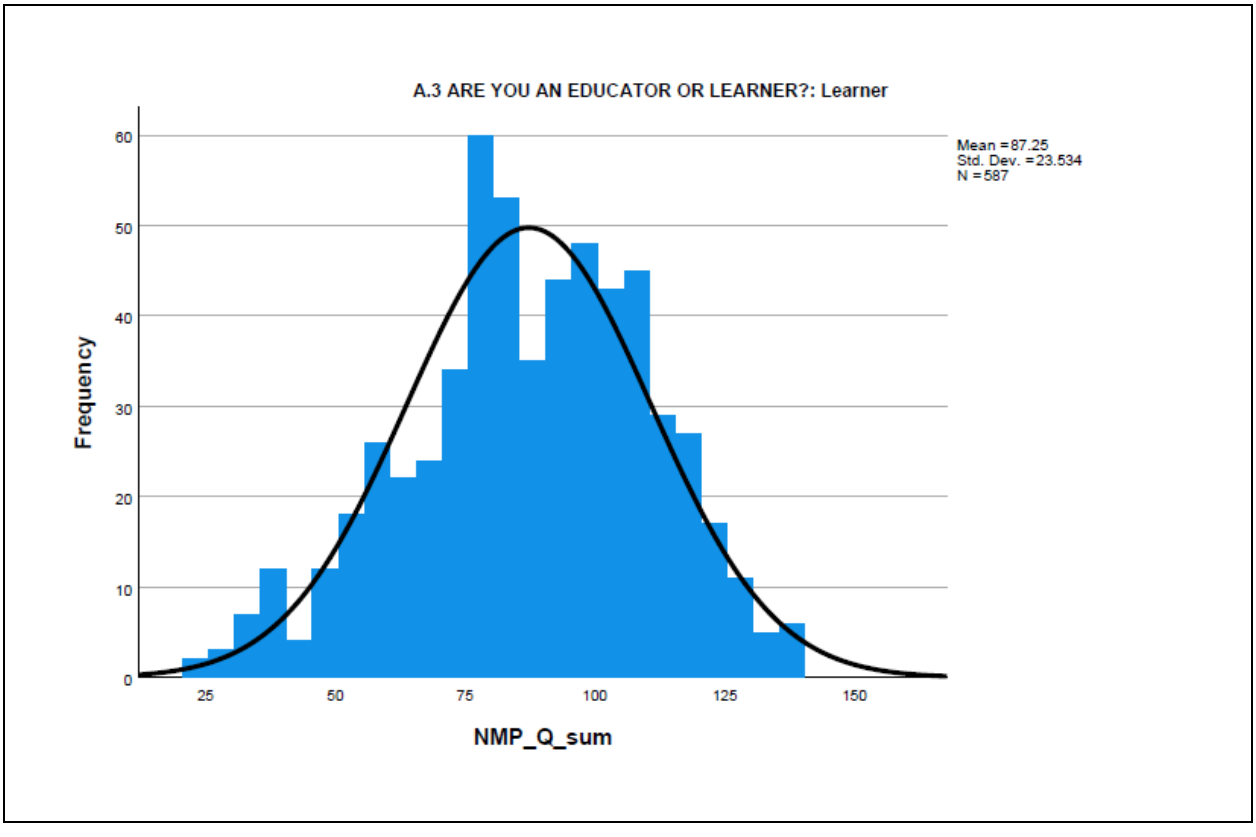


Figure 5. 3: Distribution of summated average score for nomophobia (Learners) (n = 587)



5.4 MEASURING RESPONDENTS' PERCEPTIONS ON THE USE OF MOBILE PHONES ON THE QUALITY OF TEACHING AND LEARNING (RESEARCH OBJECTIVE 3)

The results presented in this section relate to the third research objective, namely, to establish the teachers' and learners' perceptions of the impact or extent of nomophobia on the quality of teaching and learning in Gauteng schools. According to the literature, the quality of teaching and learning is motivated by a nexus of various factors; it has been indicated that an understanding of these factors and their relationship with each other will assist in gaining greater insight into the impact of nomophobia on the quality of teaching and learning Studies have found that significant data regarding factors which influence the quality of teaching and learning, and nomophobia could be uncovered by understanding perceptions regarding why people use mobile phones (Gezgin et al., 2018; Davie & Hilber, 2017; Yildiram & Correia, 2015).

For the purposes of this study, it was therefore important to explore the reasons why educators and learners use or would be deterred from using mobile phones to fully understand the impact of nomophobia on the quality of teaching and learning. The researcher has chosen to explore the use of mobile phones on the quality of teaching first and then the quality of learning.

5.4.1 Agreement with statements on the use of mobile phones and the quality of teaching

Respondents were presented with 3 statements about the use of mobile phones and the quality of teaching. Respondents were requested to indicate levels of agreement using a seven-point Likert-type scale. Table 5. 11 and Table 5. 12 report the percentage of respondents (educators and learners respectively) who responded, “strongly disagree”, “disagree”, “partially disagree”, “neutral”, “partially agree”, “agree” and “strongly agree” to the reasons presented for the use of mobile phones and the quality of teaching.

The mean and standard deviation scores are also reported, providing a sense of the extent of agreement and dispersion of ratings around the mean. To further makes sense of the ratings, the scores for “strongly disagree”, “disagree” and “partially disagree” were combined and classified as “disagree” for reporting purposes. Similarly, the scores for “partially agree”, “agree” and “strongly agree” were combined and classified as “agree”. Higher levels of agreement with a statement would be associated with higher levels of acceptance of that statement being the reason educators and learners approve of the use of mobile phones in the classroom.

It should be noted that, in some cases, significant proportions of respondents neither agreed nor disagreed, were neutral. However, for the purpose of this study, the results focus only on those that agreed in comparison to those that disagreed. In such cases, the standard deviation would typically be higher.

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
Teachers can improve the lesson if they can use their mobile phones in the classroom	5,18	1,667	6,1%	3,0%	6,1%	9,1%	24,2%	30,3%	21,2%	15,2%	75,8%
Teachers can use websites to explain topics they are not familiar with	5,48	1,661	3,0%	6,1%	3,0%	9,1%	21,2%	21,2%	36,4%	12,1%	78,8%
I feel teachers would be distracted with a mobile phone in the classroom	4,21	1,833	9,1%	18,2%	3,0%	18,2%	21,2%	24,2%	6,1%	30,3%	51,5%
CONSTRUCT ***Mobile phones and the quality of teaching***	4,81	1,27									
Cronbach's alpha	0,580										

Table 5. 11: Agreement with statements about the use of mobile phones on the quality of teaching (Educators) (n=33)

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
Teachers can improve the lesson if they can use their mobile phones in the classroom	4,59	2,186	14,8%	9,5%	6,3%	14,5%	10,2%	15,7%	29,0%	30,7%	54,9%
Teachers can use websites to explain topics they are not familiar with	5,58	1,684	14,8%	9,5%	6,3%	14,5%	10,2%	15,7%	29,0%	12,6%	79,2%
I feel teachers would be distracted with a mobile phone in the classroom	4,20	2,129	16,0%	12,3%	9,0%	16,5%	12,3%	12,6%	21,3%	37,3%	46,2%
CONSTRUCT ***Mobile phones and the quality of teaching***	4,66	1,38									
Cronbach's alpha	0,435										

Table 5. 12: Agreement with statements about the use of mobile phones on the quality of teaching (Learners) (n=587)

More than 75% of educators (75,8%) agreed with the statement ‘Teachers can improve the lesson if they can use their mobile phones in the classroom’ compared to the percentage of learners that agreed with the statement (54,9%). However, more learners (79,2%) agreed with the statement, ‘Teachers can use websites to explain topics they are not familiar with’ as compared to educators’ responses (78,8%). Approximately half of the teachers (51,5%) agreed with the statement ‘I feel teachers would be distracted with a mobile phone in the classroom’ as compared to learners (46,2%). This indicates that educators and learners feel that a mobile phone in the classroom can be a useful educational resource, but they also seem to be weary of the fact that there can be distractions that emanate from the use of mobile phones in the classroom.

Factor analysis is a ‘data reduction’ technique. It takes a large set of variables and looks for a way the data may be ‘reduced’ or summarised using a smaller set of factors or components. It does this by looking for ‘clumps’ or groups among the intercorrelations of a set of variables (Pallant, 2016). For this reason, Factor analysis was not used for these three items since they related to the construct of the use of mobile phones on the quality of teaching.

The Cronbach’s Alpha for educators (0,580) and for learners (0,465) are low and may be a result from

- a small number of test items or questions;
- heterogeneity of items which measure more than one concept, construct of knowledge area; and
- poorly interrelated items.

It may be noted that aiming for high reliability would make the items more similar and less unique in assessing different knowledge areas of the domain. Consequently, content validity can be adversely affected by high reliability coefficients (Ekolu & Quainoo, 2019).

Pallant (2016) advises that if a low Cronbach's alpha is recorded then it is more appropriate to report the mean inter-item correlation which is acceptable between 0.2 and 0.4. The summary item statistics for educators and learners is reported in Table 5. 13. The mean inter-item correlation for educators (0.316) and for learners (0.212) are both acceptable.

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Educator	Item Means	4,818	3,788	5,485	1,697	1,448	0,819	3
	Item Variances	2,965	2,758	3,360	0,602	1,218	0,117	3
	Inter-Item Correlations	0,316	0,306	0,333	0,027	1,087	0,000	3
Learner	Item Means	4,656	3,802	5,581	1,779	1,468	0,795	3
	Item Variances	4,049	2,834	4,779	1,945	1,686	1,122	3
	Inter-Item Correlations	0,212	0,067	0,419	0,352	6,267	0,027	3

Table 5. 13: Summary item statistics for mobile phones and the quality of teaching

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	4,818	4,368	5,268	4,835	4,666	1,612	1,269	-0,107	0,409	-0,775	0,798

Table 5. 14: Descriptive statistics of Educators responses to mobile phones and the quality of teaching (n=33)

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	4,656	4,544	4,768	4,696	4,666	1,901	1,378	-0,245	0.101	-0,296	0,201

Table 5. 15: Descriptive statistics of Learners responses to mobile phones and the quality of teaching (n=587)

Table 5. 14 and Table 5. 15 provide descriptive statistics for the responses of educators and learners to the use of mobile phones on the quality of teaching. In this study, more educators feel that mobile phones in the classroom can improve the quality of teaching (M=4.818, 95% CL 4.835; 5,268) than learners (M=4,656; 95% CL 4.544; 4,768). The distribution of the use of mobile phones in the classroom and the quality of teaching is shown in Figure 5.4 (educators) and Figure 5.5 (learners). For educators, a mean of 4,82 was reported, with a standard deviation of 1,27, while a mean of 4,66 and a standard deviation of 1,379 were reported for learners. It is therefore evident from these statistics and the histogram that respondents generally reported a moderate level of acceptance for the use of mobile phones in the classroom to improve the quality of teaching.

Figure 5. 4: Distribution of average score for mobile phones and the quality of teaching (Educators) (n = 33)

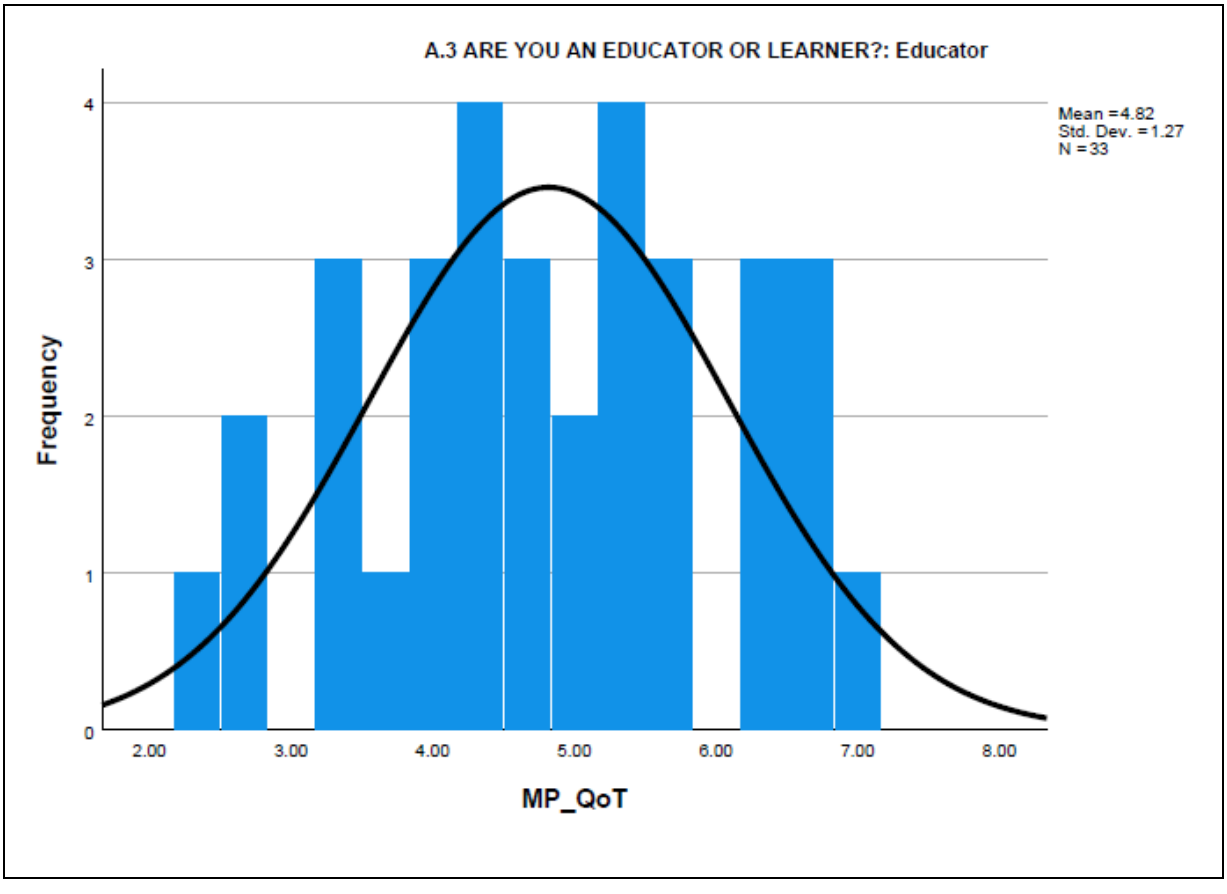
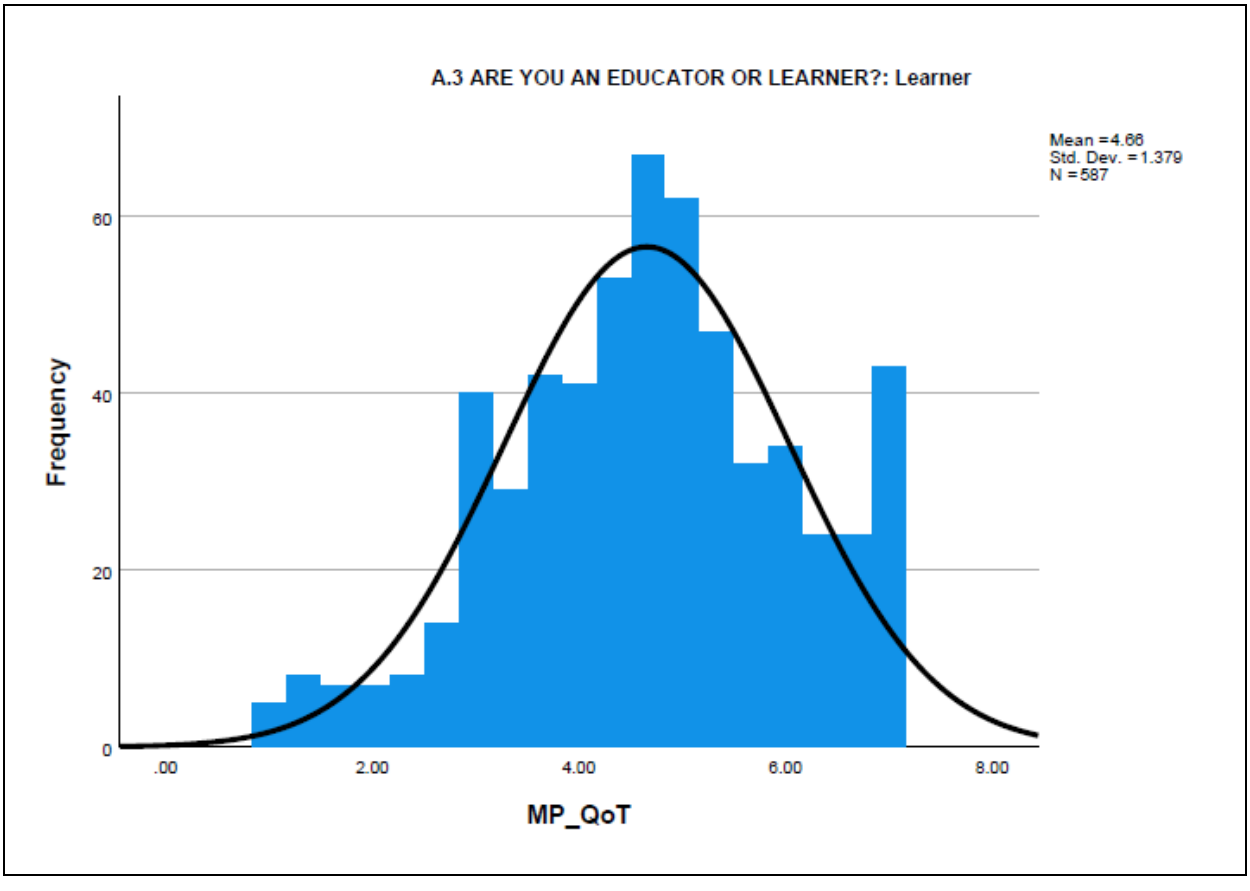


Figure 5. 5: Distribution of average score for mobile phones and the quality of teaching (Learners) (n = 587)



A two-sample t-test was performed to compare the level of acceptance of mobile phones for improving the quality of teaching among educators and learners. There was not a significant difference in the levels of acceptance of mobile phones for the quality of teaching between educators (M = 4.82, SD = 1.27) and learners (M = 4.65, SD = 1.379); t (618) = 0.658, p = 0,511. The results as reported indicate that the usage of mobile phones in the classroom and the quality of teaching seemed to be consistent across educators and learners with no significant differences reported in mean levels ($p > 0.05$).

5.4.3 Agreement with statements on the use of mobile phones and the quality of learning

Respondents were presented with 3 statements about the use of mobile phones and the quality of learning. Respondents were requested to indicate levels of agreement using a seven-point Likert-type scale. Table 5. 16 and Table 5. 17 report the percentage of respondents (educators and learners respectively) who responded, “strongly disagree”, “disagree”, “partially disagree”, “neutral”, “partially agree”, “agree” and “strongly agree” to the reasons presented for the use of mobile phones and the quality of learning.

The mean and standard deviation scores are also reported, providing a sense of the extent of agreement and dispersion of ratings around the mean. To further make sense of the ratings, the scores for “strongly disagree”, “disagree” and “partially disagree” were combined and classified as “disagree” for reporting purposes. Similarly, the scores for “partially agree”, “agree” and “strongly agree” were combined and classified as “agree”. Higher levels of agreement with a statement would be associated with higher levels of acceptance of that statement being the reason educators and learners approve of the use of mobile phones in the classroom.

It should be noted that, in some cases, significant proportions of respondents neither agreed nor disagreed, were neutral. However, for the purpose of this study, the results focus only on those that agreed in comparison to those that disagreed. In such cases, the standard deviation would typically be higher.

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
If learners are allowed to have mobile phones in the classroom it can improve the quality of learning	4,12	1,728	9,1%	12,1%	12,1%	21,2%	21,2%	18,2%	6,1%	33,3%	45,5%
If learners have mobile phones in the classroom, it will encourage the sharing of knowledge	4,03	1,776	3,0%	27,3%	12,1%	12,1%	18,2%	21,2%	6,1%	42,4%	45,5%
If learners have mobile phones in the classroom extension activities can be given from learning websites	4,45	1,804	3,0%	18,2%	12,1%	12,1%	18,2%	24,2%	12,1%	33,3%	54,5%
CONSTRUCT ***Mobile phones and the quality of learning***	4,20	1,62									
Cronbach's alpha	0,900										

Table 5. 16: Agreement with statements about the use of mobile phones on the quality of learning (Educators) (n=33)

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
If learners are allowed to have mobile phones in the classroom it can improve the quality of learning	4,89	2,081	10,7%	8,3%	6,5%	12,4%	12,8%	16,2%	33,0%	25,6%	62,0%
If learners have mobile phones in the classroom, it will encourage the sharing of knowledge	5,13	1,909	7,0%	7,5%	6,1%	11,8%	11,6%	24,7%	31,3%	20,6%	67,6%
If learners have mobile phones in the classroom extension activities can be given from learning websites	5,54	1,676	4,1%	4,4%	3,9%	11,1%	11,6%	27,4%	37,5%	12,4%	76,5%
CONSTRUCT ***Mobile phones and the quality of learning***	5,19	1,63									
Cronbach's alpha	0,822										

Table 5. 17: Agreement with statements about the use of mobile phones on the quality of learning (Learners) (n=587)

Table 5. 16 and Table 5. 17 show that less than half the teachers (45,5%) agreed with the statements ‘If learners are allowed to have mobile phones in the classroom it can improve the quality of learning”, and the statement ‘If learners have mobile phones in the classroom, it will encourage sharing of knowledge’ (45,5%). This in comparison to learners where almost a third of the learners agreed with these statements (62,0% and 67,6%). More than half the teachers (54,5%) and more than three quarters of learners (76,5%) agreed with the statement ‘If learners have mobile phones in the classroom extension activities can be given from websites.’

Factor analysis is a ‘data reduction’ technique. It takes a large set of variables and looks for a way the data may be ‘reduced’ or summarised using a smaller set of factors or components. It does this by looking for ‘clumps’ or groups among the intercorrelations of a set of variables (Pallant, 2016). For this reason, Factor analysis was not used for these three items since they related to the construct of the use of mobile phones on the quality of teaching. The Cronbach’s Alpha for educators (0,900) and for learners (0,822) are acceptable.

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	4,202	3,629	4,774	4,187	4,333	2,611	1,615	0,058	0,409	-1,212	0,798

Table 5. 18: Descriptive statistics of Educators responses to mobile phones and the quality of learning (n=33)

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	5,185	5,053	5,317	5,290	5,333	2,649	1,627	-0,716	0,101	-0,427	0,201

Table 5. 19: Descriptive statistics of Learners responses to mobile phones and the quality of learning (n=587)

Table 5. 18 and Table 5. 19 show that in this study more learners feel that mobile phones in the classroom can improve the quality of teaching (M=5.185, 95% CL 5.053; 5,317) than educators (M=4,202; 95% CL 3,629; 4,774). The distribution of the use of mobile phones in the classroom and the quality of learning is shown in Figure 5.6 (educators) and Figure 5.7 (learners). For educators, a mean of 4,20 was reported, with a standard deviation of 1,616, while a mean of 5,19 and a standard deviation of 1,627 were reported for learners. It is therefore evident from these statistics and the histogram that respondents generally reported a moderate to high level of acceptance for the use of mobile phones in the classroom to improve the quality of learning.

Figure 5. 6: Distribution of average score for mobile phones and the quality of learning (Educators) (n = 33)

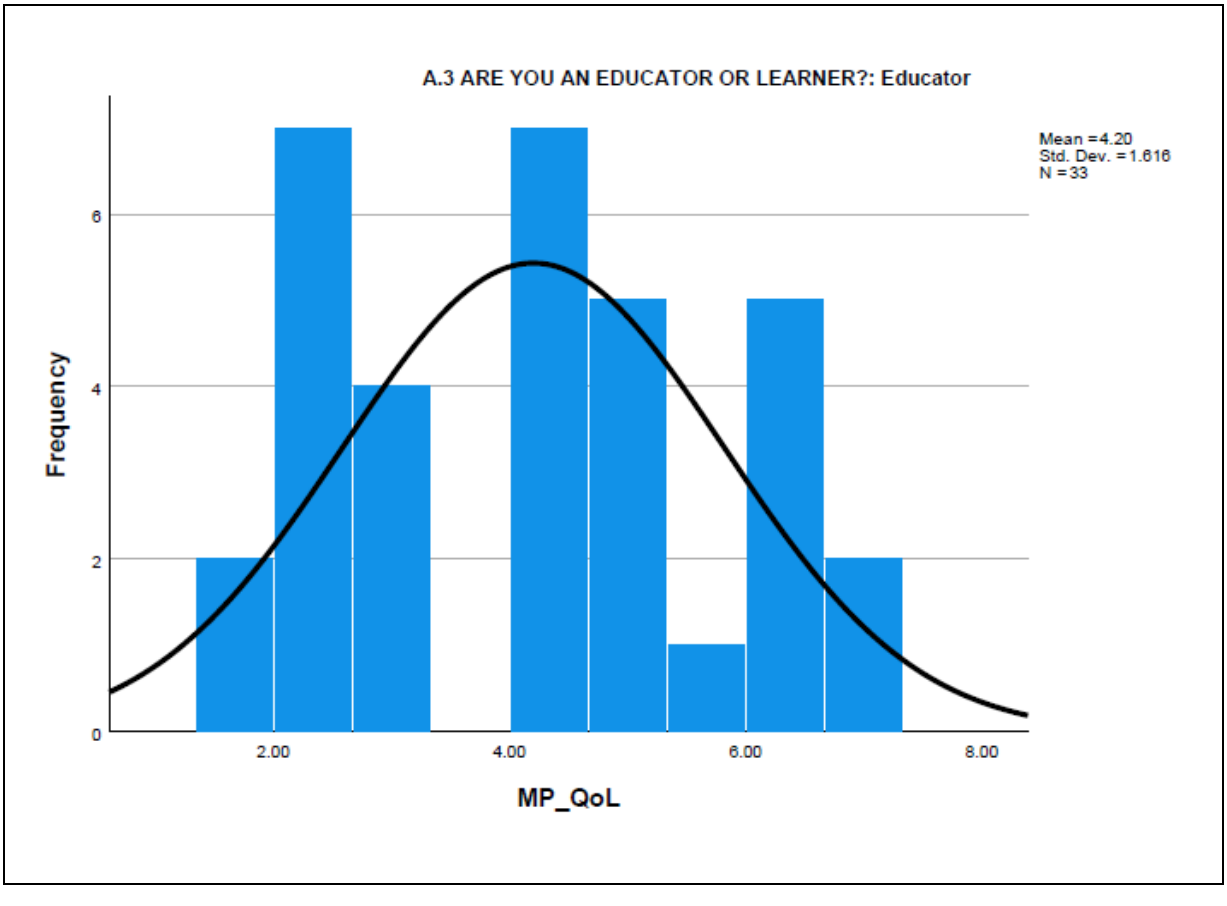
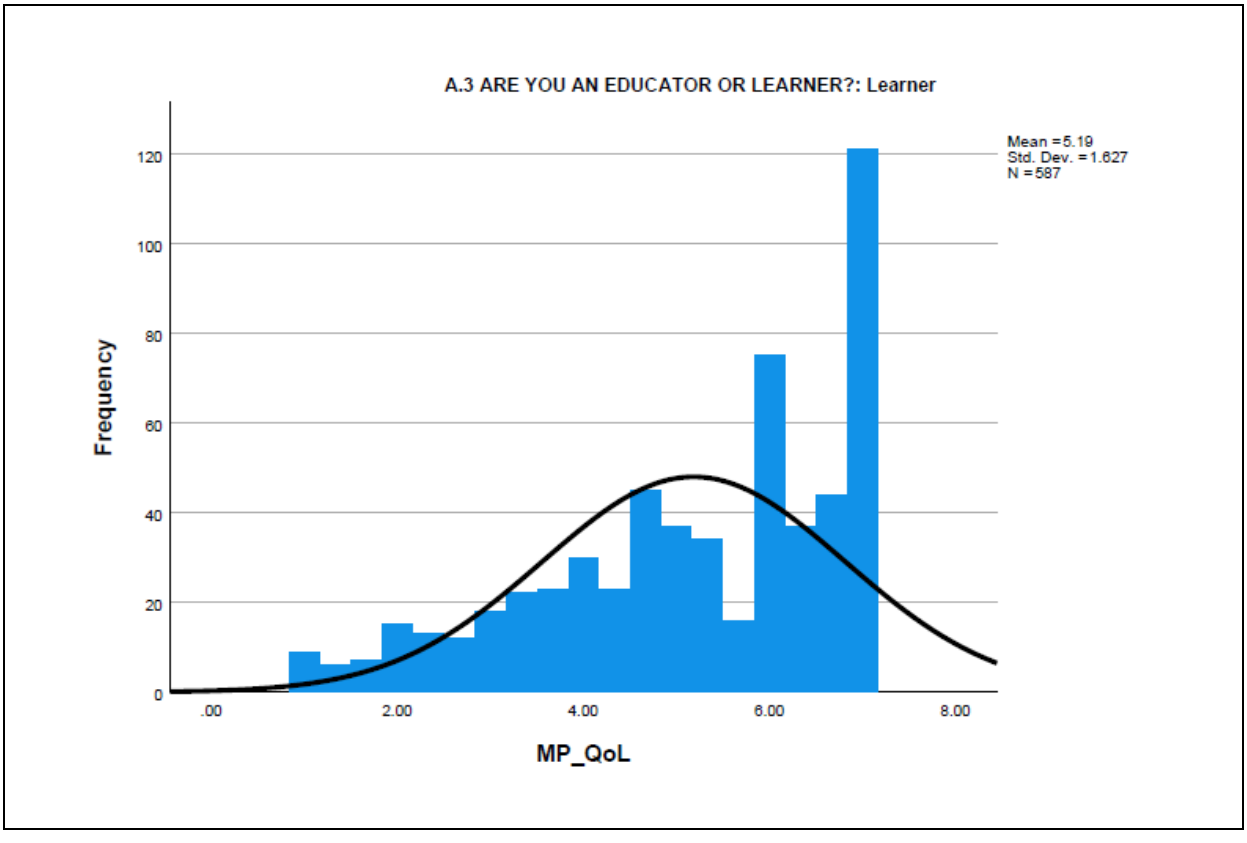


Figure 5. 7: Distribution of average score for mobile phones and the quality of learning (Learners) (n = 587)



A two-sample t-test was performed to compare the level of acceptance of the use of mobile phones in the classroom on the quality of learning among educators and learners. There was a significant difference in the levels of acceptance among educators (M = 4.20, SD = 1.616) and learners (M = 5.19, SD = 1.627); t (618) = -3.380, p = 0,001, on the use of mobile phones to improve the quality of learning in the classroom. The results as reported indicate that the usage of mobile phones in the classroom and the quality of learning seemed not to be consistent across educators and learners with significant differences reported in mean levels ($p < 0.05$).

5.5 AGREEMENT WITH STATEMENTS ON MANAGING THE IMPACT OF MOBILE PHONE USE (RESEARCH OBJECTIVE 4)

This section relates to the fourth research objective, namely, to determine how the negative impact of nomophobia on teaching and learning in Gauteng classrooms be managed effectively? This part of the research merely suggests whether indeed distractions caused by mobile phones in the classroom can be managed. In which way they can be managed will be answered by the qualitative part of this study. Respondents were presented with 1 statement about managing the impact of mobile phone use. Respondents were requested to indicate levels of agreement using a seven-point Likert-type scale. Table 5. 20 and Table 5. 21 report the percentage of respondents (educators and learners respectively) who responded, “strongly disagree”, “disagree”, “partially disagree”, “neutral”, “partially agree”, “agree” and “strongly agree” to the item presented for managing the impact of mobile phone usage.

The mean and standard deviation scores are also reported, providing a sense of the extent of agreement and dispersion of ratings around the mean. To further make sense of the ratings, the scores for “strongly disagree”, “disagree” and “partially disagree” were combined and classified as “disagree” for reporting purposes. Similarly, the scores for “partially agree”, “agree” and “strongly agree” were combined and classified as “agree”. Higher levels of agreement with a statement would be associated with higher levels of acceptance of that statement that distractions caused by mobile phones in the classroom can be controlled.

It should be noted that, in some cases, significant proportions of respondents neither agreed nor disagreed, were neutral. However, for the purpose of this study, the results focus only on those that agreed in comparison to those that disagreed. In such cases, the standard deviation would typically be higher.

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
Distractions caused by mobile phones in the classroom can be controlled	4,27	2,050	15,2%	12,1%	6,1%	12,1%	18,2%	24,2%	12,1%	33,3%	54,5%
CONSTRUCT ***Managing the impact of mobile phone use***	4,27	2,050									
Cronbach's alpha	None calculated										

Table 5. 20: Agreement with statement about managing the impact of mobile phone use (Educators) (n=33)

	Mean	SD	Strongly Disagree	Disagree	Partially Disagree	Neutral	Partially Agree	Agree	Strongly Agree	Top 2-box Disagree	Top 2-box Agree
Distractions caused by mobile phones in the classroom can be controlled	4,91	2,010	9,9%	7,8%	6,3%	12,6%	12,6%	21,8%	29,0%	24,0%	63,4%
CONSTRUCT ***Managing the impact of mobile phone use***	4,91	2,010									
Cronbach's alpha	None calculated										

Table 5. 21: Agreement with statement about managing the impact of mobile phone use (Learners) (n=587)

Table 5. 20 and Table 5. 21 reveal that more than half the educators (54,5%) agreed with the statement ‘distractions caused by mobile phones in the classroom can be controlled’, while almost two-thirds (63,4%) of the learners agreed with the statement. Since there was only one item under this construct, no Cronbach’s Alpha was calculated and no factor analysis had to be under taken.

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	4,272	3,545	4,999	4,187	5,000	4,205	2,050	-0,393	0,409	-1,214	0,798

Table 5. 22: Descriptive statistics of Educators responses to managing the impact of mobile phone use (n=33)

Construct	Mean	95% confidence interval for mean Upper bound	95% confidence interval for mean Lower bound	5% trimmed mean	Median	Variance	S D	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Mobile phones and the quality of teaching	4,914	4,751	5,077	5,016	6,000	4,041	2,010	-0,681	0,101	-0,810	0,201

Table 5. 23: Descriptive statistics of Learners responses to managing the impact of mobile phone use (n=587)

Table 5.22 and Table 5.23 illustrate that more learners feel that the impact of mobile phone use can be managed in the classroom (M=4.914, 95% CL 4.751; 5.077) than educators (M=4.272; 95% CL 3.545; 4.999). The distribution of managing the impact of mobile phone use in the classroom is shown in Figure 5.8 (educators) and Figure 5.9 (learners). For educators, a mean of 4,27 was reported, with a standard deviation of 2.01, while a mean of 4.91 and a standard deviation of 2.01 were reported for learners. It is therefore evident from these statistics and the histogram that respondents generally reported a high level of acceptance for managing the impact of mobile phone distractions in the classroom.

Figure 5. 8: Distribution of average score for managing the impact of mobile phone use (Educators) (n = 33)

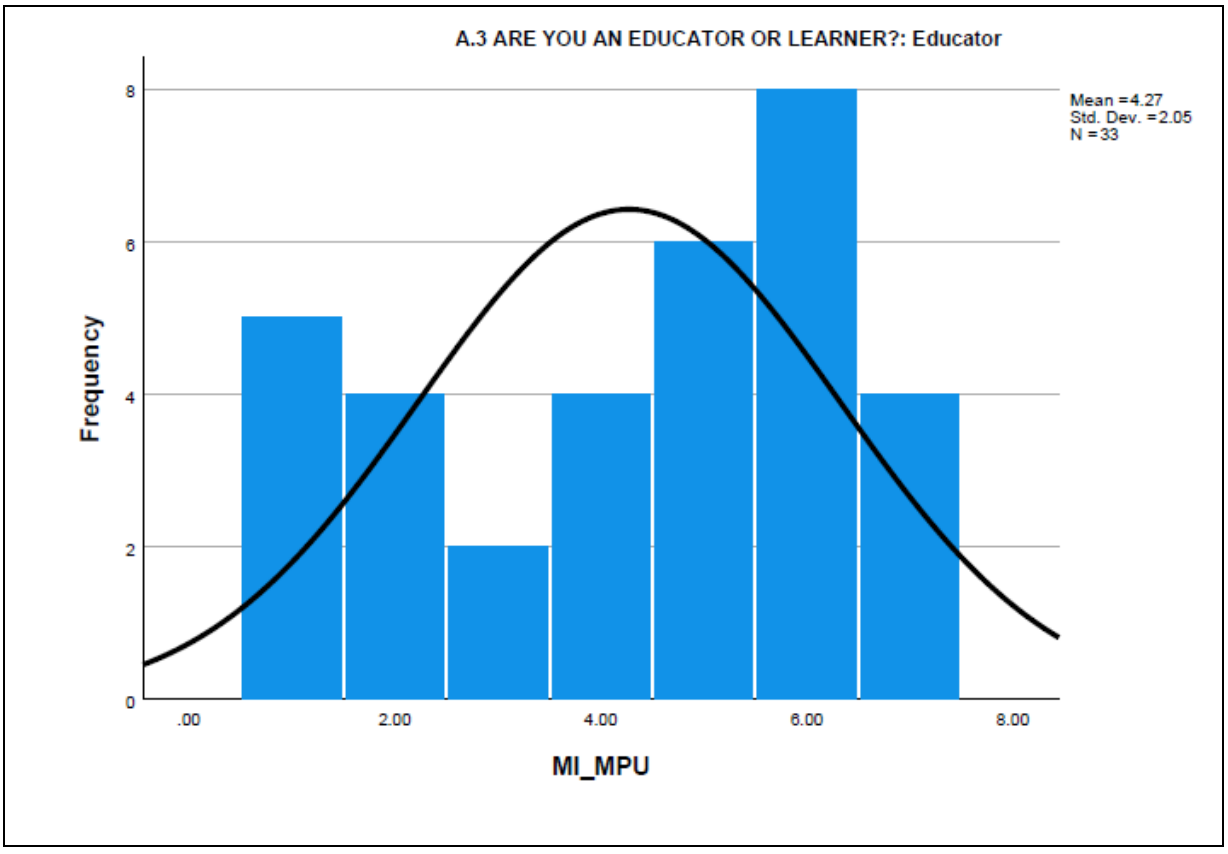
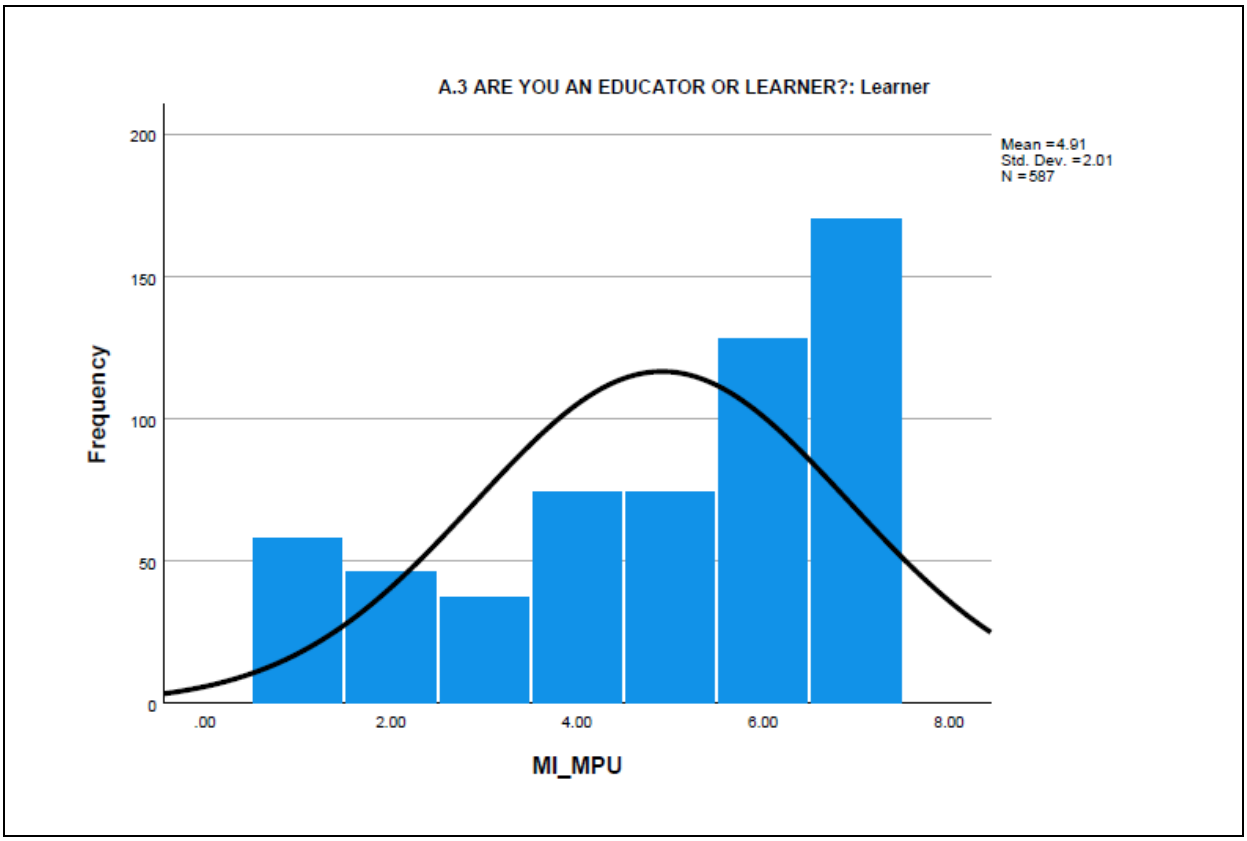


Figure 5. 9: Distribution of average score for managing the impact of mobile phone use (Learners) (n = 587)



A two-sample t-test was performed to compare the level of acceptance of managing the impact of mobile phone use in the classroom among educators and learners. There was not a significant difference in the levels of acceptance among educators (M = 4.272, SD = 2.05) and learners (M = 4.914, SD = 2.01); t (618) = -1.784, p = 0,075, on managing the impact of mobile phone use in the classroom. The results as reported indicate that the managing the impact of mobile phone use in the classroom seemed to be consistent across educators and learners with no significant differences reported in mean levels (p > 0.05).

5.6 CONSTRUCT LEVEL CORRELATIONS AND GROUP DIFFERENCES

It is important to test the relationship between the constructs for learners and educators as this provides insight into the main research question which is ‘How can the impact

of nomophobia on the quality of teaching and learning in Gauteng schools be managed?' Table 5. 24 illustrates the correlation between the constructs and the significance level for educators and learners. The Pearson's correlation coefficient was used to determine the strength of the relationship between the constructs. Refer to Table 5. 1 for the relevant acronyms.

	Educators (n=33)		Learners (n=587)		Total (n=620)
	Pearson Correlation	Sig. (2-tailed)	Pearson Correlation	Sig. (2-tailed)	Sig. (2-tailed)
NMP_Q - MP_QoT	0,139	0,439	0,161	0,000	0,930
NMP_Q - MP_QoL	-0,073	0,685	0,341	0,000	0,017
NMP_Q - MI_MPU	-0,250	0,161	0,242	0,000	0,006
MP_QoT - MP_QoL	0,203	0,257	0,436	0,000	0,133
MP_QoT - MI_MPU	0,400	0,021	0,264	0,000	0,573
MP_QoL - MI_MPU	0,426	0,013	0,492	0,000	0,622
NMP_Q - MP_QoT	0,139	0,439	0,161	0,000	0,930

Table 5. 24: Construct level correlation (Educators and learners)

Table 5. 24 reveals:

- A weak negative correlation which is not significant between the nomophobia questionnaire (NMP-Q) and, mobile phones and the quality of learning (MP-QoL) exists for educators, r = -0.073, n=33, p>0.001 (p = 0.685). This indicates that as educators' personal perceptions of nomophobia increase, the use of mobile phones on the quality of learning decreases.
- A weak negative correlation which is not significant between the nomophobia questionnaire (NMP-Q) and managing the impact of mobile phone use exists for educators (MI-MPU), r=-0.250, n=33, p>0.001 (p = 0.161). This indicates that as educators' personal perceptions of nomophobia increase, managing the impact of mobile phone use decreases.

- The correlation between constructs for learners are all positive. There is a moderately strong correlation which is significant between mobile phones and the quality of learning (MP-QoL) and managing the impact of mobile phone use (MI-MPU), $r = 0.492$, $n=587$, $p<0.001$. This indicates that learners feel that the use of mobile phones on the quality of learning increases as managing the impact of mobile phone use in the classroom increases.
- Furthermore, the correlation between the constructs for learners are all significant $p<0.001$.

5.7 ANALYSIS OF VARIANCE BETWEEN SUBJECTS

For this study, the researcher wanted to investigate how two factors affect a response construct/variable and whether or not there is an interaction effect between the two factors on the response construct/variable. A two-way ANOVA was used to determine how independent variables, in combination, affect a dependent variable.

A two-way between-groups analysis of variance was conducted to explore the impact of different constructs on each other, as measured by the questionnaire. Participants were divided into two groups according to being an educator or learner (the factors). The ANOVA revealed the following:

- The interaction effect of being an educator or learner on the perception of nomophobia, and mobile phone use on the quality of teaching was not statistically significant, $F (1, 616) = 0.008$, $p = 0.930$. There was no statistically significant main effect for educators and learners, $F (1, 616) = 0.007$, $p = 0.933$. The main effect for mobile phone use on the quality of teaching, $F (1, 616) = 2.491$, $p = 0.115$, did not reach statistical significance.
- The interaction effect of being an educator or learner on the perception of nomophobia, and mobile phone use on the quality of learning was statistically significant, $F (1, 616) = 5.695$, $p = 0.017$ ($p<0.05$). There was no statistically significant main effect for educators and learners, $F (1, 616) = 0.020$, $p = 0.888$.

The main effect for mobile phone use on the quality of learning, F (1, 616) = 2.459, p = 0.117, did not reach statistical significance.

- The interaction effect of being an educator or learner on the perception of nomophobia and managing the impact of mobile phone use in the classroom was statistically significant, F (1, 616) = 7.583, p = 0.006 (p<0.05). There was no statistically significant main effect for educators and learners, F (1, 616) = 0.127, p = 0.721. The main effect for managing the impact of mobile phone use in the classroom, F (1, 616) = 0.002, p = 0.961, did not reach statistical significance.

5.8 CONCLUSION

The results of the quantitative data for this study were presented and discussed in this chapter. Primary quantitative data for this study were collected through a survey that was conducted amongst a sample of educators and learners within the case (A secondary public school in Gauteng). A total of 620 valid questionnaires were received and analysed.

The sample profile in relation to demographic characteristics of respondents was presented. Educators and learners' responses were compared separately and together. This chapter reports respondents' perceptions on whether they suffer from nomophobia and to what extent. This addresses the second research objective. The first research objective has been dealt with in Chapter 2, the literature review.

This chapter further presents the results pertaining to respondents' perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning. This addresses the third research objective. Consideration of the respondents' perception on whether distractions caused by mobile phones can be controlled in the classroom is examined with the quantitative results. This addresses the fourth research objective.

Finally, the quantitative results are studied to investigate the statistical relationship between perceptions of nomophobia and the quality of teaching and learning.

Furthermore, the statistical significance of the use of mobile phones on the quality of teaching and learning was studied with managing the impact of mobile phone use in the classroom. This section addresses the main research question.

The next chapter discusses the qualitative results.

CHAPTER SIX
PRESENTATION AND ANALYSIS OF QUALITATIVE RESULTS

6.1 INTRODUCTION

In the previous chapter, the results of the quantitative data for this study were presented and discussed. Primary quantitative data for this study were collected through a survey that was conducted amongst a sample of educators and learners within the case (A secondary public school in Gauteng). A total of 620 valid questionnaires were received and analysed.

The sample profile in relation to demographic characteristics of respondents was presented. Educators and learners' responses were compared separately and together. The previous chapter reports respondents' perceptions on whether they suffer from nomophobia and to what extent. This addressed the second research objective. The first research objective has been dealt with in Chapter Two, the literature review.

The previous chapter further presents the results pertaining to respondents' perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning. This addressed the third research objective. Consideration of the respondents' perception on whether distractions caused by mobile phones can be controlled in the classroom was examined with the quantitative results. This addressed the fourth research objective.

Finally, the quantitative results were studied to investigate the statistical relationship between perceptions of nomophobia and the quality of teaching and learning. Furthermore, the statistical significance of the use of mobile phones on the quality of teaching and learning was studied with managing the impact of mobile phone use in the classroom. This section addressed the main research question.

This chapter will present and discuss themes emerging from the qualitative data on managing the impact of nomophobia on the quality of teaching and learning. As already indicated in Chapter Four, semi-structured interviews were conducted with all levels of

teachers and the principal at a Gauteng public school. The principal was also interviewed but for the sake of confidentiality he will be referred to as Teacher XX. Fifteen learners were interviewed across all grades, from grade 8 to grade 12. Table 6. 1 illustrates the pseudonyms used for the educators and learners.

Pseudonyms for educators	Pseudonyms for learners
Teacher A	Learner 01
Teacher B	Learner 02
Teacher C	Learner 03
Teacher D	Learner 04
Teacher E	Learner 05
Teacher F	Learner 06
	Learner 07
	Learner 08
	Learner 09
	Learner 10
	Learner 11
	Learner 12
	Learner 13
	Learner 14
	Learner 15

Table 6. 1: Pseudonyms for educators and learners

An interview guide was used which comprised of a series of open questions focusing on managing the impact of nomophobia on the quality of teaching and learning. All open-ended questions in the interviews were addressed through content analysis, to develop meaning to the responses of participants in order to answer the research questions. The data was processed by transcribing all the interviews and analysing the responses. The main aim of the study as described in Chapter One can be divided into the following sub-aims:

- Define and describe the concept of nomophobia and how it can be overcome.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the teachers' and learners' perceptions of the impact or extent of nomophobia on the quality of teaching and learning in Gauteng schools; and

- Discuss how the negative effect or impact of nomophobia on the quality of teaching and learning in Gauteng schools can be managed effectively.

The presentation from the analysis of the data were supplemented with direct quotations and discussed in the context of the literature reviewed in Chapter Two. This chapter contains analysis of the responses of teachers to the questions posed in the semi-structured face to face interviews. The data was also categorised into themes that were derived from and in accordance with the questions in the questionnaire. The relevant sub-themes were derived from recurring codes.

The semi-structured interview schedule for educators and learners were slightly different and the responses of educators and learners were recorded separately. The chapter unfolds as follows: background information of participant; access to information; giving up convenience; not being able to communicate; losing connectedness; quality of teaching; quality of learning and managing the use of a mobile phone to improve lessons in the classroom.

The chapter continues to unfold by interpreting the data. The relationship between the quantitative phase (Phase 1), the qualitative phase (Phase 2) and the literature review, together with the theoretical framework, is presented.

6.2 THE RESEARCH PROCESS

Data was collected using face to face semi-structured interviews. Two interview schedules were used to conduct all twenty-one interviews. An interview schedule was used for six educators (Annexure G) and a separate interview schedule was used for fifteen learners (Annexure H). Seven main questions were further sub-divided and asked in the interviews. I tried to adhere to the interview schedule so as to obtain a consistent set of data, however, I found teachers and learners addressing all the different questions from the outset of the interviews. I did not want to interfere in their thought process, so I allowed them to talk as long as it was relevant to the research. These questions were grouped into four sections so as to compartmentalise the data into main sections that were derived from the sub-aims outlined in Chapter One. These

sub-aims were expanded upon as the data was collected to include a broader look at the reality of what is taking place in terms of managing the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. There did seem to be an obvious overlap of questions in the interview schedule. It became apparent that the participants felt they had answered the questions posed in a previous question as the questions were quite closely related with very slight differences. I did explain as the interviews progressed that to ensure that I had the relevant data I needed to pose the questions quite close in content to one another. These interviews took place in May/June 2022. The school was chosen using purposeful sampling.

I first contacted the principal of the Gauteng School (the case) and sought permission from him to conduct interviews at the school. When I arrived at the school, I requested the principal to read the principal information sheet (Annexure C) and to sign the consent form. I showed him the research ethics clearance certificate from UNISA (Annexure I) and the GDE research approval form (Annexure J). I informed the school SGB chairperson and the district director that I would be conducting research at the school.

To begin each interview, I thanked the participant for their time, explaining that I know that their time is very precious and am most grateful for the sacrifice they were making. I informed the interviewee that the interview would be recorded and asked the educator participants to read the participant information sheet (Annexure D), and to sign the letters of consent. Learners had to sign an assent form (Annexure F) and parents had to sign a consent form for their child to participate in the research (Annexure E). I explained that the interview and identity of each participant is confidential. The interview then progressed with most of the interviews taking under one hour. I would conclude each interview with another heart felt thank you.

After the participants agreed to the recording, they signed the consent forms. The researcher set up two recording devices (2 cell phones) and the interview commenced. The anxiety experienced prior to each interview decreased significantly the more interviews were undertaken. The participants were gracious with their time and an hour

seemed more than enough time to get through all the questions in the interview schedule. Participants gave extremely detailed answers citing many examples.

The interviews were transcribed and although a lengthy and time-consuming activity, it was most beneficial as the emerging themes were identified. Every attempt was made to give as much detail in the transcription as possible. Word for word records took place and my own words were recorded as well. I found that participants wanted acknowledgement for what they said by saying, 'You know?' and I responded by saying 'Yes' or 'Ok'. I did not record every 'Yes' and 'Ok' that I uttered in the transcripts. The transcript for Learner 01 is in Annexure K.

All of the participants took their time to read the participant information sheet before the interview. Once the interview began, the participants relaxed, and it was evident that the participants felt comfortable and peaceful. Part of this was due to the conversational tone I set during the early phases of the interview.

Trustworthiness of data was ensured by implementation of the following strategies. Interviews were transcribed to ensure that the words said, and the correct meaning was represented in the transcription. Reliability of data was enhanced as participants were asked to review the transcript on what was heard during the interviews. I was in the field long enough to ensure that my data is credible. The questions in the interview schedule seemed excessive, and the questions posed were closely related to one other. I made sure that certain measures of trustworthiness of this research were observed throughout the study. This assisted in avoiding bias or distorting the data collected. Detailed notes were obtained as the interviews were recorded and detailed transcription took place. The interviews were recorded using the participant's own words. I have documented the research procedures with as much detail as possible. An outside person should be able to follow the steps used in this study.

This was a single case study of one Gauteng public school that bans the use of mobile phones in the classroom. Six teachers and fifteen learners from the school participated, giving a total of twenty-one participants that responded. In attempting to analyse the data from the interviews I decided to separate the responses of teachers from the

learners. I would like to reiterate that the results of this study are applicable to the research case of one school and does not necessarily reflect on the wider teaching fraternity.

6.3 DATA PRESENTATION AND ANALYSIS

6.3.1 Introduction

In-depth face-to-face interviews were conducted with the participants selected for the study. The participants include a sample of educators and learners whose school bans the use of mobile phones in the classroom. This section presents the data obtained from the interviews.

The results obtained from the interviews have been arranged in sequence with the responses received from the questions in the interviews. The sequential order of the questions has been adhered to as far as possible. Participants did speak about benefits and challenges from the onset of the interview and I arranged the data under the relevant headings.

6.3.2 Biographical data of participants

			ARE YOU AN EDUCATOR OR LEARNER?		
			Educator	Learner	Total
GENDER	Male	N	2	6	8
		%	33,3%	40,0%	38,1%
	Female	N	4	9	13
		%	66,7%	60,0%	61,9%
	Total	N	6	15	21
		%	***100,0%***	***100,0%***	***100,0%***

Table 6. 2: Biographical profile of participants in the study

Table 6. 2 shows that research was conducted at one school (the case) where six educators' and fifteen learners were interviewed at the school. A total of twenty-one participants responded to the interviews. Furthermore, the gender distribution suggests there were more female educators than male educators at the school. This aligns with the results of the quantitative study.

			ARE YOU AN EDUCATOR OR LEARNER?		
			Educator	Learner	Total
DO YOU OWN A MOBILE PHONE?	Yes	N	6	13	19
		%	100,0%	86,7%	90,5%
	No	N		2	2
		%		13,3%	9,5%
	Total	N	6	15	21
		%	100,0%	100,0%	100,0%

Table 6. 3: Owning a mobile phone.

Table 6. 3 indicates that all educators own a mobile phone. Among learners all do not own a mobile phone but those learners that do not own a phone do have access to a mobile phone. The results concur with the results of the quantitative study.

Experience	**Number of years' experience**
Teacher A	8
Teacher B	15
Teacher C	19
Teacher D	30
Teacher E	12
Teacher F	18

Table 6. 4: Educators' number of years' experience

Table 6. 4 clearly shows that teachers with varying years of experience were interviewed to ensure the richness of data that is sought in qualitative research. However, the research lacks the thoughts of newly qualified educators.

Grade	Number of learners interviewed in grade
Grade 8	3
Grade 9	3
Grade 10	3
Grade 11	3
Grade 12	3
Total	15

Table 6. 5: Learners current grade in school

Table 6. 5 shows that three learners from each grade were interviewed. A total of fifteen learners were interviewed.

6.3.3 Analysis of data obtained from interviews.

The data are arranged in sequence with responses received from the interviews to highlight key themes as they relate to managing the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. Qualitative data uses words rather than numbers to explain how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. The research was conducted in the natural environment of the participants. This design is rich and holistic as it focuses on the lived experiences of the participants. Qualitative research is itself interactive as the method of obtaining information involves one-on-one interactions between the researcher and the participants.

6.3.3.1 Access to information

This section required the participants to divulge what kind of information they regularly check up on. Furthermore, participants had to say how they feel when they don't have access to this information. Participants had to say what kind of movies or videos they watch and how often do they do this. Finally, participants indicated whether they had a favourite game and how much time they spend on this game.

I have chosen a table format to highlight the words and phrases used by the participants to illustrate their feelings and perceptions about their mobile phone usage. I have also separated the educators' perceptions from the learners' perceptions as it would align with the quantitative part of the study.

Participant	Information regularly checked up on	Feelings on not having access to this information	Movies or You-tube videos that you watch	Favourite game that you play	Time spent on accessing this information
Teacher A	Teaching content, emails, Instagram, Facebook and WhatsApp	Frustrating	Cooking videos	None	Not too much time
Teacher B	I like to see what's trending, what's happening education wise, personal stuff about my religion.	I am okay. It's not a big issue. It's part of my life, not my whole life	Short clips on You-Tube	None	Quite a bit
Teacher C	WhatsApp messages, group messages, school related groups like soccer and to check something important on the internet.	It becomes irritating not to know and I sometimes feel left out.	You-Tube videos sometimes, like comedies.	Word games	A little bit – I play games once in a blue moon
Teacher D	People getting access to me for work, and family and friends, most of the time I use WhatsApp.	I feel like something is missing.	I often watch a Netflix series in the evenings on my phone. I watch You - Tube videos related to spirituality or sport.	Not a fan of games on phones or computer games.	I keep checking my phone regularly.
Teacher E	Resources for my subject on the Internet.	I feel stuck	You-Tube videos on crafts which is my hobby	None	Most of the time
Teacher F	Weather and checking the time	I feel unprepared	Action movies and You-Tube videos to research.	No, I do not	A lot

Table 6. 6: Participants' perceptions on access to information (Educators) (n=6)

Teacher A expressed concerns about the worldwide energy crisis,

> *'When electricity was cut off in the past few days, it was frustrating. We become so used to using our phones all the time and checking up on messages.'*

Teacher C explained how he uses his mobile phone for relaxation,

> '*I like to watch comedies, it is not work related, it calms my mind and allows me to relax. But I don't have time to do this often, only in the school holidays and when I have no pressure from schoolwork.'*

Teacher D elaborated on the usage of his phone,

> *'I have grown so used having my phone, I keep it on silent, I keep checking my phone regularly for messages, so almost every five minutes I'm checking my phone.'*

Teacher E highlighted how important it is for educators to have current, up to date information when teaching,

> '*I rely mostly on the Internet because many textbooks that we use are outdated.*

Teacher F summed up the value of a mobile phone in current times,

> *I have noticed over the years that my phone actually replaced a lot of things. Before it was the camera taking photos which is now in my phone. I don't wear a wristwatch anymore, I don't have a clock in my class, so I refer to my cell phone almost every period just to check up on the time. The mobile phone has a calendar with a diary, so I immediately diarise any work related or personal events. I use WhatsApp to communicate with friends, family and co-workers. With Apps like Zoom and Teams I don't have to physically go for meetings either.'*

After reading the above, it becomes apparent that educators' use their mobile phones for access to work related information. Mobile phones allow them to stay in touch with people from work, their families and friends. Educators do feel uncomfortable without access to the information they regularly check up on and they spend a lot of time on their mobile phones. In exploring the feelings of educators', I am hoping to get a clear understanding of the perceptions of educators' access to information.

Participant	Information regularly checked up on	Feelings on not having access to this information	Movies or You-tube videos that you watch	Favourite game that you play	Time spent on accessing this information
Learner 01	News reports, news updates and Instagram	It really hurt	Modelling and tutoring videos	Subway surfer	A lot about 2 to 3 hours on games only per day
Learner 02	WhatsApp and I play some games.	I feel very sad	School related You-Tube videos	Subway surfer	Maybe for 30 minutes everyday
Learner 03	WhatsApp messages from family and friends	I feel very sad	Cooking videos	Building blocks	About 1 to 2 hours every day on my games
Learner 04	You-Tube educating myself more about maths, soccer and sports.	I feel disappointed and scared	You Tube videos on mathematics	FIFA	I play FIFA daily for about 5 hours.
Learner 05	Daily motivation, weather, news and schoolwork	Not so bad because I can actually watch TV	You-Tube videos on schoolwork and sports	FIFA	Not so much
Learner 06	Checking the time and messages from anyone.	A bit lost	Astronomy and sometimes sports	Call of duty	A lot
Learner 07	WhatsApp, You-Tube and TikTok	I don't feel bad	None	Candy Crush	A little bit
Learner 08	Google for the latest textbooks, news and different subjects that pop up in my mind, WhatsApp, and Facebook	I think it's good but at the same time its bad, I just feel mixed emotions	No, I don't like movies	None	Phone is boring, I don't spend hours, I spend minutes on my phone in a day
Learner 09	Face book, WhatsApp	I'm normal, because you have to discipline yourself	Body building movies and body building supplements	Car parking	About 5 to 6 hours per day
Learner 10	Wikipedia getting information on schoolwork and Instagram	Kinda difficult	None	Criminal case	On the weekends for about 5 hours
Learner 11	Past papers on the internet, Snap Chat, WhatsApp, TikTok and Instagram	I can do without	Netflix	Fort night	Abou half an hour a day
Learner 12	I watch medical student blogs and school videos	Not that bad	Mostly Life Sciences and Physics	Not really	On a daily basis I would say about 4 hours
Learner 13	Just social things that are happening around me and education	Very disorientated	Not anymore	None	About 6 hours per day
Learner 14	Currently I check information on universities, I look at news as well and I look at academic work like past papers	Very frustrated	Yes, I watch movies on my cell phone on painting, drawing and writing short stories	None	Quite a bit

Learner 15	Mainly school based stuff but sometimes its other activities such as sport and what's happening currently in the world	I don't really care	Entertainment world, music sometimes	Clash of Clans and Call of Duty	Say around 3 hours a day

Table 6. 7: Participants' perceptions on access to information (Learners) (n=15)

It is clear from Table 6. 7 that learners spend a considerable amount of time on their mobile phones. Furthermore, unlike educators, learners have an affinity for games and spend a lot of time playing these games. When I enquired further, Learner 01, Learner 02, Learner 10 and Learner 11 admitted to being addicted to these games. Learner 10 used the words '*I am hooked on Criminal Case.'* They explained that the games are designed to improve their own scores or take them to the next level, so it is very difficult to leave the game. Learner 15 said, *'I was addicted to these games at some point in my life, but currently I stopped since I started with grade 12.'*

Learner 04 said he found it relaxing to play games but stressed the importance of discipline, '*I find it relaxing to play FIFA, and although it is distracting, I am disciplined enough to stop when I need to.'* Learner 05 said, *'The games refresh my mind,'* Learner 11 said, '*it relieves stress,'* and Learner 15 said, *'it calms you down.'* These were the expressions used by learners to justify the playing of games.

Learner 06 reminds me that learners have a life outside school and interests outside of school subjects and curriculum, *'The nice thing about having a cell phone is that you can still do things that are outside school but that are still informative. I am a person who is interested in the moon, space and the whole universe.'*

Learners used their mobile phones to access resources for schoolwork, and to keep in touch with family and friends.

6.3.3.2 Giving up convenience.

This section required the participants to express how they felt if their mobile phone ran out of data, or if the battery life runs out or if they forget their mobile phone at home.

Learners had to say how they felt about not being able to bring their mobile phones to school.

Participant	If you run out of data how long will it take you to buy data again	If your battery life runs out, what do you do?	If your mobile phone is (forgotten) at home, how do you feel?
Teacher A	Immediately	My battery is always charged at 78 to 80 percent	I feel lonely if I need to contact someone for some emergency
Teacher B	I have WIFI at home and we have WIFI at work too.	I watch TV, ha ha!	I feel disorientated. It's my connection to my family for emergencies.
Teacher C	I don't have WIFI at home, I always have data, I buy once it's finished. I don't like running out of data and so I buy often.	It does run out sometimes because I only charge my phone once at night	It doesn't trouble me at all, I am not that addicted
Teacher D	I have unlimited data at home, and I have a school data package, WIFI at school so I am fortunate not to have to buy data.	My previous phone I had to charge almost twice a day, so that people could get access to me.	I think people need to get access to me, so it feels funny not to have a phone around me.
Teacher E	Same time	I put it on a charger immediately, if I have access to a charger	I feel lost, I feel cut off from the world
Teacher F	I have WIFI at home, at school and I have data on my phone. I make sure there is enough data all the time.	It's just one of those things	Because I'm always checking the time, I feel lost.

Table 6. 8: Participants' perceptions on giving up convenience (Educators) (n=6)

Teacher B complained,

> *'What irritates me about this phone is that I am now married to this thing. I don't like the fact that I must carry the phone with me when I go to Pick and Pay, and my family gets angry with me when I don't have my phone or if I don't answer calls immediately.'*

Teacher F explained how important her mobile phone is in case of emergencies, '*I don't find myself stressed out if my phone dies, but I do have that occasional anxiety of receiving bad news relating to my family and I wasn't accessible to them.'*

Table 6. 8 makes it clear that educators' feel it is important to have access to WIFI or to have data on their mobile phones all the time. Educators main concern is that they must be reachable to their families for emergencies.

Participant	If you run out of data how long will it take you to buy data again	If your battery life runs out, what do you do?	When your mobile phone is at home and you are at school, how do you feel?
Learner 01	I have to wait till my father buys for me, sometimes it can take 2 to 3 weeks	I make sure my battery is always full otherwise I go into panic mode	It's difficult but I have accepted I can't bring my phone to school
Learner 02	I use my sisters' phone, so if there's no data, there's no data. I sometimes ask my father if I can use his phone.	I have no control over my sisters' phone.	I don't feel very sad
Learner 03	I buy 2GB data twice a month, it has to last	I make sure it's fully charged	When I get home, the first thing I do is check my phone for messages. When I'm at school I constantly think about my phone
Learner 04	I have WIFI at home	I charge my phone 5 times a day, making sure it's 100% charged all the time	I get home and I immediately look at my phone. Also play a quick game of FIFA
Learner 05	I have WIFI at home and I also have data on my phone.	Before I leave the house to go anywhere, I make sure that it's 100% charged.	When I'm at school it doesn't affect me as much really, because I know that I am here to learn.
Learner 06	When my brother gets paid, he buys me airtime for R10. Sometimes data. I sometimes have to wait a week, maybe two weeks before I get data.	My battery life does run out. When I go to sleep, I put my phone to charge.	It depends on what we doing at school. If it's something interesting, then I know I will research it as soon as I get home on my phone.
Leraner07	I have to share my cell phone with my sister, so it's a bit complicated. When we run out of data my dad buys more for us in a day or two. We don't have WIFI at home.	It doesn't bother me if it gets finished, but I try to keep it fully charged.	When I'm at school I focus on school and don't really worry about my phone.
Learner 08	We have unlimited data on our WIFI at home. I don't have data on my phone.	I leave my phone to charge when I go to sleep. It's not always fully charged.	Yes, I sometimes cheat and bring my phone to school. Hoping and praying that my phone doesn't get confiscated.
Learner 09	We have unlimited WIFI at home.	It doesn't bother me if my phone is not fully charged.	I'm fine, it doesn't affect me.
Learner 10	We have WIFI at home and my phone contract comes with 10GB of data.	The minute it gets to 50%, I charge it.	Immediately when I get home, I check my messages. I feel lonely without my phone.
Learner 11	We have WIFI at home and I basically get data every month.	My phone battery does run out.	I don't really miss my cell phone, because at school I think about schoolwork and not about my cell phone.

Learner 12	I don't have WIFI at home, but I do get data at month end. If I run out of data, my parents will get more for me.	My battery life does run out, this is very frustrating when I need to use my cell phone for something.	My mind does not wander to my cell phone at home because I know I will go back home to it.
Learner 13	I don't have WIFI at home. I buy my own data. I spend about R30 every 3 days.	I try not to let my battery life run out.	I do cheat sometimes and bring my phone to school. Once it was taken, and I was very scared and anxious.
Learner 14	I buy about 10GB data, but I have to share it with others.	My phone is always flat, and it's very frustrating.	I do bring my phone to school sometimes. Sometimes I hand it in to the office. I am afraid of my cell phone getting stolen.
Learner 15	I have WIFI at home and I also have data.	Sometimes my phone does need charging.	I don't miss my phone at school, because my friends are here, and they are the ones I use the phone to communicate with.

Table 6. 9: Participants' perceptions on giving up convenience (Learners) (n=15)

Table 6. 9 illustrates that learners have WIFI at home and have data on their mobile phones too. Learners try to keep their mobile phones fully charged and when it's not charged, they find it frustrating if they need to use their phones. Except for 3 learners who admitted to cheating and bringing their mobile phones to school when it's not allowed, the other learners said that they did not worry about their mobile phones when they were at school. Learner 15 puts it succinctly, '*I don't miss my phone at school, because my friends are here, and they are the ones I use the phone to communicate with.'*

6.3.3.3 Not being able to communicate.

This section required the participants to express how they felt if they were unable to communicate with friends or family or deal with work related issues. Participants were also asked if they struggle with FOMO (fear of missing out). They were asked if they prefer communicating with someone face to face or via their mobile phones.

Participant	Do you use your mobile phone to communicate with friends/family/work related?	Do you struggle with FOMO (fear of missing out)?	Do you prefer face to face communication or via your mobile phone?
Teacher A	I use my phone to communicate with my family and mostly work related. Especially if emergencies arise.	No, I don't.	I prefer face to face interaction, even with a stranger.
Teacher B	Mostly with family. My phone is my connection with my family. If I have an emergency, I can contact them and if they have an emergency they can contact me.	No.	I feel disorientated. It's my connection to my family for emergencies.
Teacher C	I do communicate with my family most, then colleagues.	Not really.	I prefer a physical meeting. The zoom meetings got too many faults, sometimes they do not work properly.
Teacher D	I would say there are a few people who cannot get access to me because of my work, that's the one thing that allowed me to get used to having my phone around.	Nope.	I'm very flexible. I prefer face to face but I wouldn't mind using a phone device, cause we can use WhatsApp video calls, I'm comfortable with that too.
Teacher E	Family obviously.	I feel lost, I feel cut off from everyone, I feel cut off from the world.	I prefer a face-to-face conversation.
Teacher F	Mostly family.	I feel I need to be accessible to my family at all times in case they need me. So, yeah, I don't want to miss out on some emergency.	I prefer a face-to-face interview.

Table 6. 10: Participants' perceptions on not being able to communicate (Educators) (n=6)

Table 6. 10 once again reiterates the importance for educators to be able to reach their families in case of emergencies. Educators do not suffer from FOMO (fear of missing out). Educators did indicate that they prefer face to face communication instead of communicating via their mobile devices.

Participant	Do you use your mobile phone to communicate with friends/family/work related?	Do you struggle with FOMO (fear of missing out)?	Do you prefer face to face communication or via your mobile phone?
Learner 01	Extended family and close friends	I am not on any WhatsApp groups, so I don't have a fear of missing out	I prefer person to person
Learner 02	I borrow my sister's phone to communicate with friends	When my sister's data runs out, I use my father's phone, especially for school work. I do worry if I cannot get my schoolwork.	Talking one on one.
Learner 03	I communicate with my family.	Sometimes but not really that much.	I prefer one on one. What if we run out of data while talking on Zoom?
Learner 04	Sometimes with my family and friends.	No	One on one communication, even with a stranger.
Learner 05	I use my phone to keep in touch with family and friends.	Yes, because some news is important and if I don't get it on time, I actually do feel bad.	I like the experience of talking to someone one on one.
Learner 06	Sometimes.	I am an outdoor person, so it doesn't bother me if I miss out on anything on my phone.	Face to face communication.
Learner 07	Friends more than family.	Not really.	I feel nervous and shy with face-to-face communication, so I would prefer a virtual meeting.
Learner 08	I like taking selfies and pictures with my phone. I hardly use it to communicate with anyone.	No.	I prefer a face-to-face interview with someone I know but if it's a stranger then I would prefer a Zoom or Teams meeting.
Learner 09	My parents and teachers. Not with friends.	Not at all.	I am not comfortable communicating with people online.
Learner 10	I use my phone to communicate a lot with my friends and family.	A lot.	I prefer one on one.
Learner 11	Yes, with my friends and family.	Sometimes if something is trending and everybody is talking about it then I do feel like I'm missing out if I don't know about it.	I like the one on one.
Learner 12	Sometimes for friends sometimes for family.	No.	I prefer Zoom or Teams although I have never used it, but if I have to, I will learn how to use it.
Learner 13	More my friends and less often with my family.	Sometimes.	One on one is ok.
Learner 14	Mostly with my friends. If it's necessary, then with family that doesn't live with me like my aunt.	I feel frustrated if I miss out on something. Many times, there is a lot of information on WhatsApp groups that has nothing to do with me, so if I miss out on that it doesn't bother me.	It is exciting to learn something new so Zoom or Teams would have been interesting.
Learner 15	I use it mostly to keep in touch with my friends, although I sometimes need my phone for my family too.	No, I don't really care. I try to focus on what I need to do.	I feel that you are not connecting with a person through the phone, so it's better to communicate face to face.

Table 6. 11: Participants' perceptions on not being able to communicate (Learners) (n=15)

Table 6. 11 illustrates that learners use their mobile phones to communicate more with their friends than with their families. Learners did not suffer too much from FOMO (fear of missing out), unless it was something of importance.

Learner 11 puts it quite clearly, *'Sometimes if something is trending and everybody is talking about it then I do feel like I'm missing out if I don't know about it.'* Learner 14 makes it clear that mobile phone groups have a lot of information that is irrelevant and says, *'Many times there is a lot of information on WhatsApp groups that has nothing to do with me, so if I miss out on that it doesn't bother me.'*

Most learners said they preferred face to face communication, however, Learner 12 and Learner 14 said that they would like to learn something new and for that reason would prefer a Zoom or Teams meeting. *'I prefer Zoom or Teams although I have never used it, but if I have to, I will learn how to use it.'* (Learner 12) and *'It is exciting to learn something new so Zoom or Teams would have been interesting.'* (Learner 14)

6.3.3.4 Losing connectedness.

In this section participants were asked if they followed any social media websites and how often they viewed these websites.

Participant	Which social media websites do you follow?	How often do you view these sites?
Teacher A	I have access to it but I am not a keen follower.	
Teacher B	I am a member of Facebook and Instagram.	I rarely ever look at them.
Teacher C	WhatsApp and Facebook.	I check WhatsApp all the time but I can't remember when last I went on Facebook.
Teacher D	Facebook and Instagram	I rarely get onto those apps.
Teacher E	Instagram and Facebook	When I'm free I check them.
Teacher F	TikTok	I hate Facebook, it's just too much information. I view TikTok when I need something stimulating. Once a week I binge watch TikTok. It gives instant gratification.

Table 6. 12: Participants' perceptions on losing connectedness (Educators) (n=6)

Table 6. 12 shows that educators are not keen followers of social media websites. Teacher F elaborated, '*The information overload can be hard to deal with and I really need a clean break from all of it and sometimes I just do a social detox.'*

Participant	Which social media websites do you follow?	How often do you view these sites?
Learner 01	None really.	
Learner 02	Instagram, people that I know at church.	Maybe once a week.
Learner 03	I like TikTok. I follow educational videos.	Not all the time. It needs a lot of data and I hardly ever get data.
Learner 04	None.	
Learner 05	Instagram.	I have 400 followers and I view it whenever I have free time.
Learner 06	Instagram.	I have 129 followers and I view it sometimes.
Learner 07	Instagram.	Once a day at least.
Learner 08	Facebook.	I don't spend hours on Facebook, but I do spend many minutes on it.
Learner 09	Facebook.	Some time.
Learner 10	No social media.	
Learner 11	Instagram.	Whenever I have a little bit of time.
Learner 12	Instagram	Maybe once or twice a day.
Learner 13	Instagram, WhatsApp, Twitter, Facebook and TikTok.	Almost every day.
Learner 14	Facebook and Instagram.	Once a day.
Learner 15	No, I don't really use it	

Table 6. 13: Participants' perceptions on losing connectedness (Learners) (n=15)

Table 6. 13 illustrates that learners do follow social media websites but do not spend too much time on it.

6.3.3.5 The quality of teaching

In this section, participants had to articulate what in their opinion determines an excellent quality of teaching. Participants were asked if the introduction of a mobile phone in the classroom can improve the quality of teaching. Educators were asked if the quality of their lessons improved with a mobile phone in the classroom. Learners were asked if they felt educators would be distracted if they had mobile phones in the classroom.

Participant	What determines an excellent quality of teaching?	Do you think using a mobile phone in the classroom can improve the quality of your teaching?	If you did not have a mobile phone at all, do you think the quality of your lessons would be better?
Teacher A	Discipline is very important for me. The teachers' knowledge on the subject content and the manner with which they deliver that content to the learners.	The mobile phone gives us access a whole world of knowledge, but there has to be proper controls. The learners are the digital generation, and they are comfortable with their cell phones so it can improve their knowledge.	I would make sure I have access to information through a laptop or tablet. Access to information is very important in the teaching profession.
Teacher B	If our assessment results are good, that would be a good indication that it is a good school.	If the network speed is fast and teachers have immediate access to YouTube, then it can be very beneficial. We didn't have all of this in our time.	If the phone is used purely for social media friends and networking, it can be a distraction for the educator. If teachers are more geared to schoolwork, it can be beneficial.
Teacher C	Discipline. If a school has good discipline all other things will fall into place. A teacher must plan for good quality teaching to take place. Final matric results also indicate that a school has a high standard of education.	To a certain extent. There are some videos that you can show to learners like earthquakes and volcanos which will make learners understand the concepts better.	Lessons would not be better without the Internet. Teachers today have more information at their fingertips compared to teachers of twenty years ago.
Teacher D	Usually, we determine that through our assessments, if our results are good, that gives a good indication that it's a good school.	Yes, it can to a certain extent. If teachers know what they are doing and how to use the technology, they can improve the lesson.	I don't think so. The Internet that is available on mobile phones is integral to having a good quality lesson.
Teacher E	A school that has good teachers who have access to good resources.	To a certain extent yes.	A mobile phone with Internet is very important for teaching nowadays.
Teacher F	When learners have good general knowledge and a good command of the English language. Also, if learners display good manners. To outsiders' matric results would indicate it is a good school.	Having smartboards can be used in a constructive way with learners, cell phones in class can improve the quality of teaching. I'm all for using technology in education.	We need to work towards a paperless society. I like to send the link of a TikTok video on, for example, mitosis and encourage learners to watch it. I feel it has higher rate of retention for the learners.

Table 6. 14: Participants' perceptions on the quality of teaching (Educators) (n=6)

Table 6. 14 shows educators are vocal about the fact that discipline is key to an excellent quality of education,

'Discipline is very important for me." (Teacher A)

'Discipline. If a school has good discipline all other things will fall into place.' (Teacher C)

'Also, if learners display good manners.' (Teacher F).

Educators have indicated that assessment results and high-stake exams like matric results are important factors in determining if a school is a good school (Teacher B, Teacher C, Teacher D and Teacher F). Good educators who have access to resources and plan their lessons are important for a good quality of teaching (Teacher A, Teacher C and Teacher F).

All the educators agreed that being able to use a mobile phone in the classroom can improve the quality of the lesson. Teacher A warns that there must be proper controls in place while Teacher D warns that educators must know what they are doing and how to use technology.

The educators were clear that using the Internet in lesson preparation and delivery was vital for the teaching profession. Teacher B says that if educators' usage of their phones is geared towards education and not socialising then it can be beneficial to improving the quality of lessons.

Participant	How would you determine an excellent quality of teaching?	Do you think if your teacher uses a mobile phone in the classroom for teaching, the lesson can be improved?	Do you feel teachers can be distracted by their mobile phones?
Learner 01	If teachers discipline learners and they make sure everything is in order.	Yes, but there would also be some distractions.	Teachers will stay on task.
Learner 02	Focus, study and listen to the teacher when they are teaching.	Yes	It can be distracting for the learners when teachers answer their phones during a lesson. It breaks the chain of thought in the lesson.
Learner 03	The school must enforce discipline and they must not tolerate any nonsense. Matric results also show that this school is a good school.	Not that much. The teacher must know their work. They can't keep looking at their phones while teacher. It will be a bit irritating.	Yes, some teachers can be distracted by their personal calls and messages while other teachers will ignore their phones during teaching.
Learner 04	Great teachers.	If a teacher uses the cell phone while teaching to me, it looks like they are unprepared for the lesson.	The cell phone can distract the teacher when they have to attend to personal matters. They can play games and chat to their friends.
Learner 05	The teacher comes prepared to class and uses the time properly to deliver a good lesson. Discipline is also important. Good matric marks also tell me that it is a good school.	Yes, the lesson can be improved because the teacher will be able to give more information to the learners.	I think the teachers in this school are very focused. During lessons they concentrate on delivering the lesson. Once the lesson is finished, they check up on their phones.
Learner 06	Having good teachers who know their work.	I prefer that teachers rather use the cell phones to communicate with us at home and guide us on extra material and resources that we can use on the Internet. I wouldn't like to have a cell phone in the class.	I feel that the flow in the lesson will be broken if the teacher gets an unexpected call, emergency call or a message. The teacher normally leaves the classroom when this happens to attend to the call and that's when the class gets disruptive.
Learner 07	At our school the principal cares about the children's uniform. They must not wear narrow pants and their hair must be cut in a particular way. This is important for discipline, and it helps for a good quality of teaching. School results are also important.	No, it cannot improve the lesson. If the teacher keeps on looking at the phone while they are teaching, I feel that they don't know their work.	When teachers get a phone call it can be a distraction for both the teacher and the learners.
Learner 08	The rules that are implemented at a school make it a good school. Book checks, uniform checks, are a good thing because it keeps the learners on their toes. They know that they must follow the rules if they want to stay out of trouble.	It cannot improve the lesson.	While teaching if the teacher gets a phone call or a WhatsApp message and if the teacher replies to the call or message then it is a very bad thing.
Learner 09	This is a good school because its got good discipline.	No, the lesson cannot improve. I prefer having everything written down in a book. I don't want to look on my phone for work done.	Teachers will be distracted.

Learner 10	Discipline and good results. Access to information and resources.	Yes, it can improve.	The teachers at our school are very dedicated so they cannot be easily distracted. They will only answer calls if it is urgent or an emergency.
Learner 11	I think good quality teaching depends on how the teacher interacts with the learners. So, when a teacher has a good understanding with the class then the class will perform better and that is good quality teaching.	I think it can work, but most of the work must be from the teachers' knowledge. Constantly looking at the phone can break the flow of the lesson.	They can be distracted by personal issues.
Learner 12	Good communication, asking the learners questions and making sure they understand the content.	Yes, but it depends on how disciplined the teacher is.	During lessons teachers must not use their phones to do other things that are not school related. This depends on how disciplined the teacher is.
Learner 13	The dedication of the teacher and the learner. The results produced by the school.	The lesson won't improve. Teachers must engage with learners.	As much as learners can be distracted, so too can teachers. It depends from individual to individual.
Learner 14	When learners understand what they have been taught.	No.	The teachers get distracted because WhatsApp messages keep popping up and notifications from Facebook also show on their screens.
Learner 15	When a teacher and student are both engaged constantly at the same time, there is a connection between the learner and the teacher, and they can understand each other.	Certain aspects a cell phone would be good, but mostly I prefer the chalkboard.	No, I think teachers will have self-control.

Table 6. 15: Participants' perceptions on the quality of teaching (Learners) (n=15)

Table 6. 15 shows that learners like educators, feel that good discipline is important for good quality teaching.

> *'If teachers discipline learners and they make sure everything is in order.'* (Learner 01)

> *'The school must enforce discipline and they must not tolerate any nonsense.'* (Learner 03)

> *'At our school the principal cares about the children's uniform. They must not wear narrow pants and their hair must be cut in a particular way. This is important for discipline, and it helps for a good quality of teaching.'* (Learner 07)

'The rules that are implemented at a school make it a good school. Book checks, uniform checks, are a good thing because it keeps the learners on their toes. They know that they must follow the rules if they want to stay out of trouble.' (Learner 08)

Other important factors that learners cited for a good quality teaching were focus on the part of the learners; preparedness of educators; good matric results indicated a good school; educators must know their work; access to information and resources; educators' interaction with the learners; educators' understanding of the learners; dedication of the educator and having an engaged class.

Learners were not in agreement whether using mobile phones for teaching would improve the lessons. Learners were concerned that constant checking of the mobile phone by the educator would break the flow of the lesson. Some learners felt that educators would be distracted by phone calls and messages, while others felt that educators would exercise self-control.

Learner 13 sums it up nicely,

'As much as learners can be distracted, so too can teachers. It depends from individual to individual.'

6.3.3.5 The quality of learning

In this section participants had to suggest what in their opinion determines an excellent quality of learning. Participants were asked if the introduction of a mobile phone in the classroom can improve the quality of learning. Educators and learners were asked if mobile phones used at home or school would have benefits.

Participant	What determines an excellent quality of learning?	Do you think if learners were allowed to use mobile phones in the classroom, the quality of learning would improve?	Do you think that mobile phones for learners, whether used at home or in school, have benefits?
Teacher A	This depends on how disciplined the learners are and how determined they are to learn.	It depends on how disciplined the learners are, if they use the cell phones in the wrong way then it can't improve.	If learners stay focused on their schoolwork and don't use the cell phone for games and other things, then it can work.
Teacher B	Learners must focus and know what they want from life. Parents must also show an interest in learners' schoolwork.	I think if learners are not distracted. There has to be restrictions and limits for other kinds of usages, like an Internet with a firewall.	It can be used fruitfully.
Teacher C	For me if learners put effort and try the work then they can achieve a lot. Homework must be completed, and learners must stay on task in the classroom.	There have to be certain parameters within which learners must work, then the quality of learning can improve.	Yes, it would be a good thing, although I don't know how it will be controlled.
Teacher D	Learners that are disciplined and focused will reap the benefits of education.	If we have enough software like firewalls and restrictions around WIFI, then perhaps that can control which sites learners can access. If learners know that they are limited, then it will help them to focus. Leadership structures like the RCL can be used to make sure learners do what they have to.	Yes, it can work.
Teacher E	It all starts at home. If parents show an interest in a child's education, then children will show an interest in their schoolwork. If parents feel that the school is a babysitting facility where they can leave their children for the day, then children won't study.	Yes, I think it would. It would take less time; the cell phones can aid research and it can improve content for the learners.	I would approve provided there are restrictions, which is a bit difficult.
Teacher F	It's a two-way street, teachers must play their part, for learners to play their part. If teachers do not deliver an engaging lesson, then learners can be easily distracted. Also, if learners walk into the class with the intention of being disruptive then there cannot be good learning taking place.	I'm a huge advocate for the use of cell phones in the classroom. We need to equip our learners with the skills needed for the future. The safety aspect is a concern for me, that cell phones may get stolen. If all learners were to come with one make and model of phone, we can overcome that learners want to be fashionable with their phones.	I use WhatsApp groups to communicate with my learners. I find they are very effective. I also give them Google tests where they can get instant feedback, which is important for learners.

Table 6. 16: Participants' perceptions on the quality of learning (Educators) (n=6)

Table 6. 16 illustrates once again, that educators feel that a good quality learning is determined by discipline. (Teacher A and Teacher D). Some educators cited parental involvement as being very important for learning to be effective,

'Parents must also show an interest in learners' schoolwork.' (Teacher B)

> *'It all starts at home. If parents show an interest in a child's education, then children will show an interest in their schoolwork. If parents feel that the school is a babysitting facility where they can leave their children for the day, then children won't study.'* (Teacher E)

All educators agreed that if learners were allowed mobile phones in the classroom, the quality of learning would improve and that there are benefits of using mobile phones in the classroom. Teacher F said, '*I'm a huge advocate for the use of cell phones in the classroom. We need to equip our learners with the skills needed for the future.'* Educators were vocal about restrictions that needed to be imposed,

> *'There has to be restrictions and limits for other kinds of usages, like an Internet with a firewall.'* (Teacher B)

> *'There have to be certain parameters within which learners must work, then the quality of learning can improve.'* (Teacher C)

> '*If we have enough software like firewalls and restrictions around WIFI, then perhaps that can control which sites learners can access. If learners know that they are limited, then it will help them to focus.'* (Teacher D)

Participant	How would you determine an excellent quality of learning?	Do you think if learners were allowed to use mobile phones in the classroom, the quality of learning would improve?	Do you think that mobile phones for learners, whether used at home or in school, have benefits?
Learner 01	It depends on the learner, if the learner is focused then the quality will be good. But if the learner is distracted then the quality will be bad.	It will be a distraction, because the learner will rather be on the phone instead of doing the teachers work.	It would be useful to download videos so that we can learn a little bit more.
Learner 02	Learners must be self-motivated to do well.	It could.	Yes, it could.
Learner 03	Learners must be focused. Parents must also pay attention to their children's education.	Not that much because some learners don't come here to learn. They just want to chat with their friends.	Yes, especially if u want to Google something.
Learner 04	My teacher says that you can take a horse to the water, but you can't make it drink. Similarly, teachers can try their best but if learners are not interested then there is not much they can do.	No, the quality of learning won't improve. Learners can play games and if the teacher goes to them, they can switch screens quickly.	I think it's better if teachers guide learners which websites to use or check for more information. This they can do at home.
Learner 05	If many learners are doing well in a school, then the few that are not doing well will feel shy and they will start to work harder.	Yes, it can, because there is a lot of information on different websites that can be accessed.	It depends on the subject. Most education must take place in the classroom. The information on the mobile phone must supplement what the teacher teaches.
Learner 06	Learners must sit still and listen to the teachers in class if they want to learn.	Yes, it can.	I prefer it if we were to use it more at home than at school for educational purposes.
Learner 07	Discipline is important.	Yes and no. some children may take photos of themselves or chat on social media without the teacher knowing.	It can be better, then we don't have to carry textbooks and a calculator. Everything will be on the phone. But then books are better because I have something to refer to, and a phone can be a distraction.
Learner 08	Learners must pay attention for them to get the benefit of the lesson.	No. if learners have the school WIFI password, they can enter into Forex trade, watch movies and play games. The learners are smarter than the teachers where technology is concerned so they can outsmart the teachers.	There are benefits, if textbooks are loaded on the mobile phone and we don't have to carry heavy bags.
Learner 09	Discipline is key.	I prefer hard copies of everything. I don't think the quality of learning can improve with a cell phone in the classroom.	No.
Learner 10	Learners are paying attention in class when the schools matric results are good.	Certain websites do maths calculations and that can help a lot. The cell phone will enhance teaching.	I will make notes of everything on paper that I have done on the cell phone.
Learner 11	Teachers and learners must have a good understanding for the class to perform better.	I feel that it will be a distraction.	They must design a system that will control the apps that the learners have access to, then cell phones can be used in the classroom and outside the classroom.

Learner 12	Good communication, asking questions and making sure you as a learner understand the content.	I am in favour of learners having cell phones in the classroom because technology is the future and we need to get more exposure to it, especially in an educational setting.	Yes, there are lots of benefits. For physics and chemistry experiments can be watched online.
Learner 13	The learners must be dedicated to learning.	No. for learners like me who get easily distracted, I won't be able to focus in the classroom and I won't be able to engage with the lesson.	I think that the quicker we get access to information on the Internet, the quicker we forget it. Cell phones do everything for people and make them lazy. People can't think for themselves, they even Google an opinion, they can't formulate their own opinions.
Learner 14	Learners must make an effort to understand what they are taught.	The phone must be used moderately. Maybe for enrichment, not for basic teaching.	Yes, on the Internet you have access to a vast amount of information. But it must be used as a quick reference, or for checking up something. The teacher is the guider of education in the classroom.
Learner 15	Learners and teachers must be partners in the learning process. Learners must want to learn, and teachers must teach properly.	No, I don't think the lesson can improve. There won't be any order in the classroom, everyone will be doing their own thing and results would probably plummet. In smaller classrooms maybe the teacher can have better control and walk around and check that everyone is doing what they supposed to.	It is beneficial.

Table 6. 17: Participants' perceptions on the quality of learning (Learners) (n=15)

Table 6. 17 illustrates that learners held the same opinion as teachers and said that the quality of education is dependent on the amount of discipline that learners have. Learners used the following phrases and words to expand on discipline,

'*Focused'* (Learner 01 and Learner 03)

'*Self-motivated'* (Learner 02)

'*Pay attention'* (Learner 03, Learner 08 and Learner 10)

'*Sit still and listen'* (Learner 06)

'*Dedicated'* (Learner 13)

'*Make an effort'* (Learner 14).

Learners elaborated upon the importance of a good relationship between a learner and teacher in the classroom to improve learning,

> *'Teachers and learners must have a good understanding for the class to perform better.'* (Learner 11)

> *'Good communication, asking questions and making sure you as a learner understand the content.'* (Learner 12)

> *'Learners and teachers must be partners in the learning process. Learners must want to learn, and teachers must teach properly.'* (Learner 15)

Learner 04 summed up educators' and learners' thoughts on the quality of teaching by saying,

> *'My teacher says that you can take a horse to the water, but you can't make it drink. Similarly, teachers can try their best but if learners are not interested then there is not much they can do.'*

6.3.3.6 Managing the use of mobile phones to improve the quality of education.

In this section, participants had to suggest what they could do so that they can manage the use of the mobile phone to improve the quality of education. Participants were also asked to offer any final thoughts on the usage of mobile phones in the classroom.

Participant	How do you think you can manage the use of your mobile phone so that you can use it to improve lessons?
Teacher A	Learners must comply with the rules and regulations for cell phones to have benefits in education.
Teacher B	It's a culture that we need to get our teachers and learners used to, where they can use the device profitably. We need to mould them into this type of thinking. Our school should see what is happening around the world. Cell phones are an important part of education. With proper rules and regulations teachers can use it as a resource that will improve the learning environment.
Teacher C	I think cell phones must be allowed in the classroom with certain limits to accessing different sites. It will save time for teachers to write on the chalk board and will save on printing of papers and notes. Its better if textbooks are loaded on learner's cell phones because it will ease the pressure of learners having to carry textbooks. I worry about the energy crisis we are experiencing and if there is no electricity and cell phones cannot be charged then there would be no lessons taking place if we were completely dependent on technology.
Teacher D	Cell phones have become a part of our lives now. People use them for different reasons. It's like a knife you can use it to cut and hurt someone or perform an operation to heal someone. So, for me, mobile phones can be used positively, or it can be a means of destruction for the learner.
Teacher E	It could be easier for educators to manage cell phones in the classroom if we had smaller classrooms. If cell phones are managed properly, it can be beneficial, but we will always have that small number of learners that will pose a challenge.
Teacher F	When we introduced the calculator at school, we expected mathematics results to go up. Learners can't do basic arithmetic because they have become so lazy with the calculator. Some of them can't even use the calculator properly. We must not expect that using cell phones in the classroom will improve the quality of teaching and learning. It may make both educators and learners lazy. We must introduce it with care, but we must introduce it.

Table 6. 18: Participants' perceptions on managing the use of mobile phones to improve the quality of education (Educators) (n=6)

Table 6. 18 echoes the final words of educators on managing the use of mobile phones to improve the quality of education. Educators acknowledged that mobile phones have an important role to play in education, but they all stressed the importance of having proper protocols in place for the use of mobile phones to be beneficial in education. Teacher D used an interesting analogy,

> *'It's like a knife you can use it to cut and hurt someone or perform an operation to heal someone. So, for me, mobile phones can be used positively, or it can be a means of destruction for the learner.'*

Teacher F made an interesting observation,

> *'When we introduced the calculator at school, we expected mathematics results to go up. Learners can't do basic arithmetic because they have become so lazy with the calculator. Some of them can't even use the calculator properly. We must not expect that using cell phones in the classroom will improve the quality of teaching and learning. It may make both educators and learners lazy. We must introduce it with care, but we must introduce it.'*

Participant	How do you think you can manage the use of your mobile phone so that you can use it to improve the quality of your education?
Learner 01	There must be time limits imposed on the usage of cell phones in the classroom and maybe only for certain subjects, not all. Perhaps teachers can be allowed to have one cell phone period a week with learners for their subject.
Learner 02	I prefer not having a cell phone in the classroom. Phones should be handed in to the office and collected after school.
Learner 03	Instead of a cell phone we should have something with a larger screen like a laptop, so learners can stay on task because they can be watched easily.
Learner 04	I would like to be able to watch educational videos and entering school websites to look for information. I have a game addiction and that requires a lot of self-discipline and control.
Learner 05	I think I manage it well because I only use my phone after all my schoolwork is done. it requires a lot of self-discipline.
Learner 06	I can watch you-tube tutorials. I use them for maths before I write tests to check videos on for example, equations. I also like to improve my vocabulary by watching English and Afrikaans videos.
Learner 07	I still prefer a book. It allows me to stay focused. Whereas a cell phone can cause distractions with pop-ups while you are busy with your schoolwork.
Learner 08	There must be a roster or a timetable for the usage of the cell phone in the classroom. I don't think learners have the discipline or maturity to use the cell phone correctly in the classroom and this can impact negatively on their learning.
Learner 09	No matter what we do we won't be able to manage the use of the cell phone in the classroom. Cell phones will not be an effective tool for learning in the classroom. They can be used outside the classroom by learners to Google on topics of personal interest or to enrich their knowledge of topics introduced by teachers in the classroom.
Learner 10	If a teacher says that we must look at a certain website, it will enhance teaching. Maybe the video will explain the concept better than the teacher can. I still like hard copies of everything. I like to have a book and notes that I can refer to.
Learner 11	A cell phone in the classroom will be a distraction for the learners, it can only be managed by controlling what learners have access to.
Learner 12	I think we can manage the distractions caused by cell phones because once teachers and learners get used to it they won't be using it for anything except for schoolwork.
Learner 13	I think I can manage my cell phone by getting rid of my social media, then I will be able to concentrate on my schoolwork.
Learner 14	I will make sure that I use my cell phone only when all my actual work that I need to do is done.
Learner 15	I have to switch my cell phone off when I am studying. It cannot help me to improve the quality of my learning. I use it mainly to relax and calm my mind when I play games.

Table 6. 19: Participants' perceptions on managing the use of mobile phones to improve the quality of education (Learners) (n=15)

Table 6. 19 clearly shows that learners are not too keen on having mobile phones in the classroom. Learners, like educators, reiterated that if mobile phones are used in the classroom there must be controls over access to websites that learners may have. Learners mentioned a limited amount of time spent on mobile phones in the classroom,

'There must be time limits imposed on the usage of cell phones in the classroom and maybe only for certain subjects, not all. Perhaps teachers can be allowed to have one cell phone period a week with learners for their subject.' (Learner 01)

'*There must be a roster or a timetable for the usage of the cell phone in the classroom. I don't think learners have the discipline or maturity, to use the cell phone correctly in the classroom and this can impact negatively on their learning.'* (Learner 08)

Learners in their closing statements spoke mostly about self-discipline when managing the use of mobile phones in education.

6.4 DATA INTERPRETATION - INTEGRATION OF PHASE 1 AND 2

6.4.1 Introduction

It is exciting to observe how closely the data collected from the participants' interviews mirror the literature review and expand on the quantitative results. The data is interpreted according to the expansion of the sub-aims outlined at the beginning of the chapter. This study used a mixed-methods approach; more specifically a sequential explanatory mixed research design as indicated in section 4.3.1. After analysis of both quantitative and qualitative data sets separately, comparison and integration of data was done.

Section 6.4.2 presents participants perceptions on their usage of mobile phones. This addresses the second research objective. The first research objective has been dealt with in Chapter 2, the literature review.

Section 6.4.3 presents the results pertaining to participants perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning. These sections address the third research objective.

Section 6.4.4 considers the participants perception on whether distractions caused by mobile phones can be managed in the classroom. This section addresses the fourth research objective.

6.4.2 Participants perceptions on the usage of their mobile phones (Research objective 2)

Both the quantitative and qualitative results showed that educators and learners were dissatisfied when not being able to access information, giving up convenience, not being able to communicate and losing connectedness. The quantitative phase (Phase 1) showed that educators were most annoyed if they could not use their mobile phones or their capabilities when they wanted to (See section 5.3.1). This is reiterated in the qualitative phase (Phase 2) when educators use the words and expressions described in ***Table 6. 20*** to describe how they feel without having access to information (Extracted from Table 6.6).

Educator	Words and expressions
Teacher A	*'frustrating'*
Teacher C	*'irritating'*
Teacher D	*'Something is missing'*
Teacher E	*'I feel stuck'*
Teacher F	*'I feel unprepared'*

Table 6. 20: Words and phrases used by educators to describe how they feel without having access to information.

In the quantitative phase (Phase 1), learners expressed that they were most annoyed if they could not look for information on their phones when they wanted to (See section 5.3.1). Learners used phrases described in Table 6.21 to reflect on their feelings when they don't have access to information on their mobile phones (Extracted from Table 6.6).

Learner	Words and expressions
Learner 01	*'It really hurt'*
Learner 02 and Learner 03	*'I feel very sad'*
Learner 04	*'I feel disappointed and scared'*
Learner 06	*'a bit lost'*
Learner 10	*'kind a difficult'*
Learner 13	*'Very disorientated'*
Learner 14	*'Very frustrated'*

Table 6. 21: Words and phrases used by learners to describe how they feel without having access to information.

This is seen early in the literature study where Wang and Suh (2018) define nomophobia as the feelings of discomfort, anxiety, nervousness, or distress that result from being out of contact with a mobile phone.

The quantitative phase (Phase 1) and the qualitative phase (Phase 2) both show that it is very important for educators to have access to their family/friends and that they must be reachable to their loved ones. Unlike educators, that need to have constant access to their family/friends, the qualitative phase (Phase 2) revealed that learners enjoy playing games on their mobile phones and use their phones for access to social media applications like WhatsApp, You-tube, Facebook and TikTok. Learners do use their mobile phones to check up on school related information, the news, sports, and other information. It is clear that educators and learners are part of The Network Society. Kenton and Mansa (2021) describe The Network Society as the use of Internet based social media sites to stay connected with friends, family, colleagues, customers, or clients.

Learners spend a considerable amount of time on the mobile phone playing games. Learners used words *'hooked on'* (Learner 10) and *'addicted'* (Learner 15), to illustrate the amount of time spent on games on the mobile phone (See section 6.3.3.1). West and Brown (2013) say that addiction is used to refer to a chronic condition where there is a powerful motivation to engage in a particular behaviour. It is clear that Battacharya et al., (2019) were correct in saying that it's rarely the mobile phone itself that creates the compulsion, but rather the games, apps, and online worlds it connects us to.

Interestingly, the qualitative phase (Phase2) of the study shows that learners find the games to be relaxing (See section 6.3.3.1). Table 6. 22 shows the words and phrases used by learners to describe how their mobile phones are used for relaxation.

Learner	Words and phrases
Learner 04	*'relaxing'*
Learner 15	*'Calms you down'*
Learner 11	*'Relieves stress'*
Learner 05	*'Refresh my mind'*

Table 6. 22: Words and phrases used by learners to describe how their phones are used for relaxation.

Educators also use their mobile phones to relax and unwind. Educators watch movies on their mobile phones to relax. This is explained by Teacher C who says, *'I like to watch comedies, it is not work related, it calms my mind and allows me to relax.'*

This phenomenon is explained by positive reinforcement of addiction, based on classical learning theory and states that users will say they use mobile phones because they enjoy using them (Newton et al., 2009). The use of the mobile phone helps the users overall state of mind and outlook, and they are 'happier'. The positive reinforcement of an improved mood can encourage misuse of mobile phones in increased amounts (Marcen, 2017).

The quantitative phase (Phase 1) of the study shows that there is no absence of nomophobia among educators and learners (See Table 5.10). Educators and learners displayed some form of nomophobia ranging from a mild level of nomophobia to a moderate level of nomophobia to severe nomophobia. The qualitative phase (Phase 2) of the study shadows the quantitative phase (Phase 1). Some educators responding to the question on how much time they spent on their mobile phones reveal, *'Not too much time'* (Teacher A) and *'a little bit'* (Teacher C) indicating a mild level of nomophobia. Other educators used the phrases, *'Quite a lot'* (Teacher B), *'Most of the time'* (Teacher E), *'a lot'* (Teacher F) and *'I keep checking my phone regularly'* (Teacher D) to indicate a moderate to severe level of nomophobia (Extracted from Table 6.6).

Learners' responses to the amount of time spent on their mobile phones are included in Table 6. 23 (Extracted from Table 6.7).

Learner	Response to the amount of time spent on mobile phone
Learner 01	*'A lot, about 2 to 3 hours per day on games only'*
Learner 02	*'30 minutes every day'*
Learner 03	*'About 1 to 2 hours every day'*
Learner 05	*'Not so much'*
Learner 06	*'a lot'*
Learner 07	*'a little bit'*
Learner 09	*'About 5 to 6 hours per day'*
Learner 10	*'On the weekends for about 5 hours'*
Learner 11	*'About half an hour a day'*
Learner 12	*'On a daily basis about 4 hours'*
Learner 13	*about 6 hours per day'*
Learner 14	*'Quite a bit'*
Learner 15	*'Around 3 hours a day'*

Table 6. 23: Learners' responses to the amount of time spent on their mobile phones.

The time spent on the mobile phone once again indicates mild, moderate or severe nomophobia. It is evident that learners are more vocal about the actual number of hours they spend a day on their mobile phones, while educators may have been shy to reveal the actual number of hours spent by them on their mobile phones.

It must be noted that the American Academy of Paediatrics has recommended no more than two hours of screen time for children and teenagers, and absolutely no screen time for children under 2. However, they've now updated their guidelines to reflect the realities of today's digital world (Morin, 2021). The AAP's new recommendations acknowledge that technology is integrated into our daily lives, making it nearly impossible to police a strict two-hour per day limit on school-age children. Additionally, technology can be a valuable component of learning. Children access computers and tablets at school and use computers to do their homework. The AAP warns that some kids are growing dependent on their devices. They're using video games and TV as their main form of entertainment and they're replacing face-to-face communication with text messages and social media (Morin, 2021). Table 6.9 and Table 6.10 contradict

Morin (2021) as most educators and learners said that they preferred face to face communication with people.

6.4.3 Participants perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning (Research objective 3)

This section integrates participants perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning from the quantitative phase (Phase 1), the qualitative phase (Phase 2) and relates it to the literature review. I have decided to interpret the data for the quality of teaching separately from the quality of learning as that is the manner in which the data for Phase 1 and Phase 2 were collected.

6.4.3.1 The impact of mobile phone use in the classroom on the quality of teaching

In the qualitative phase (Phase 2) of the study, educators and learners were asked, 'How would you determine an excellent quality of teaching?' an overwhelming response from both educators and learners was enforcing discipline (See Table 6.13 and Table 6.14). This mirrors Obadire and Sinthumule (2021) who say that learner discipline is one of the bases of effective teaching and learning. If learners are not well disciplined, schools will not provide the best possible education. Therefore, it is important that good disciplinary measures and procedures be put in place in any school.

Learner 05 sums up Loughran (2018) who articulates that quality in teaching can be seen in the way the knowledge, skills and ability of the teacher are employed to develop meaningful pedagogic experiences for learners. Such experiences are evident when teaching impacts learning and learning influences teaching. Learner 05 says, *'The teacher comes prepared to class and uses the time properly to deliver a good lesson. Discipline is also important. Good matric marks also tell me that it is a good school.'*

Learner 05 makes mention of high-stake exam indicators that Kaagan and Smith (1985) refer to when they say indicators enable educational planners and decision makers to make comparisons against standards or global benchmarks.

The quantitative phase (Phase 1) illustrated that more than 75% of educators were of the opinion that educators can improve the lesson if they can use their mobile phones in the classroom, however, approximately 55% of learners felt that educators can improve the lesson if they can use their mobile phones in the classroom (See Table 5.11 and Table 5.12). The qualitative phase (Phase 2) gives meaning to the reason why learners held this opinion.

In the qualitative phase (Phase 2) of the study learners made the following comments when asked, 'If a teacher uses a mobile phone in the classroom, can the lesson be improved?' (See Table 6.14):

> *'There would also be some distractions.'* (Learner 01)
>
> *'The teacher must know their work. They can't keep looking at their phones while teaching, it will be a bit irritating.'* (Learner 03)
>
> *'If a teacher uses a cell phone while teaching, to me, it looks like they are unprepared for the lesson'* (Learner 04)
>
> *'Constantly looking at the cell phone can break the flow of the lesson.'* (Learner 11)

These responses were before learners were asked if teachers can be distracted by their mobile phones. Learner 06 says,

> *'I feel that the flow in the lesson will be broken if the teacher gets an unexpected call, emergency call or a message. The teacher normally leaves the classroom when this happens to attend to the call and that's when the class gets disruptive.'*

Learner 13 says,

'*As much as learners can be distracted, so too can teachers. It depends from individual to individual.'*

This is in line with the Gauteng Department of Education (GDE, 2011) and the South African Schools Act (DoE, 1996) guidelines for a mobile phone policy for learners. The guidelines acknowledge that mobile phones can cause distractions, cyber-bullying, theft and cheating.

6.4.3.2 The impact of mobile phone use in the classroom on the quality of learning

In the quantitative phase (Phase 1), of the study approximately 45% of educators felt that if learners are allowed to have mobile phones in the classroom it can improve the quality of learning (See Table5.16). In contrast to this, approximately 62% of learners felt that the quality of learning can improve if learners have mobile phones in the classroom (See Table 5.17). The qualitative phase (Phase 2) expanded on the perceptions of educators and learners on the quality of learning.

Once again, in the qualitative phase (Phase 2) of the study educators and learners emphasized the need for 'discipline' for an excellent quality of learning (See Table 6.15 and Table 6.16). The need for parental involvement was illustrated by educators and learners,

'*Parents must also show an interest in learners' schoolwork.'* (Teacher B)

'It all starts at home. If parents show an interest in a child's education, then children will show an interest in their schoolwork.' (Teacher E)

'Parents must also pay attention to their children's education.' (Learner 04)

Bronfenbrenner's (2015) ecological approach is prevalent in the above statements where he theorized that the microsystem is one immediate environment of the child, e.g., the home, family or peer group. The mesosystem is the relationship between two or more microsystems such as the link between home and school.

Educators and learners were probed that if learners were allowed to use mobile phones in the classroom, would the quality of learning improve? Educators and learners reported conflicting views. However, educators made it clear that the use of mobile phones in the classroom had to have certain boundaries and limits,

> *'There has to be restrictions and limits for other kinds of usages, like an internet with a firewall.*' (Teacher B)

> *'There have to be certain parameters within which learners must work…'* (Teacher C)

> *'If we have enough software like firewalls and restrictions around WIFI, then perhaps that can control which sites learners can access. If learners know that they are limited, then it will help them to focus.'* (Teacher D)

The expanded TPACK framework is evident in order to implement the necessary parameters described by educators. The TPACK framework argument is that design thinking should not rest solely on the teachers' shoulder but on all designations of educators (Chai et al., 2014; Matwadia, 2018).

Interestingly, the following statements reiterate Levinsen and Nielsen (2010) who state that due to the global need for competitiveness and economic growth, the corporate world is inclined to recruit a highly self-directed workforce and lifelong learners for jobs that are network related,

> *'I am a huge advocate for the use of cell phones in the classroom. We need to equip our learners with the skills needed for the future.'* (Teacher F)

> *'I am in favour of learners having cell phones in the classroom because technology is the future and we need to get more exposure to it, especially in an educational setting.'* (Learner 12)

Matusik and Mickel (2011) said that note taking using a pen and paper really does result in better recall and retention of study material. This is cited by Learner 09 who says,

> *'I prefer hard copies of everything, I don't think the quality of learning can improve with a cell phone in the classroom.'*

Khalife (2017) warns that while a forward-thinking, digital-embracing approach to education with M-learning found to be undeniably useful, it also results in learners losing touch with older skills that do not rely on technology. This is reflected in the statement,

> *'I think that the quicker we get access to information on the Internet, the quicker we forget it. Cell phones do everything for people and make them lazy. People can't think for themselves, they even Google an opinion, they can't formulate their own opinions.*' (Learner 13)

Many learners and educators have said that having mobile phones in the classroom can cause distractions. Learner 13 says,

> *'For learners like me who get easily distracted, I won't be able to focus in the classroom and I won't be able to engage with the lesson.'*

6.4.3.3 Summary of the impact of mobile phone use in the classroom on the quality of teaching and learning (Research objective 3)

It is evident that educators and learners had conflicting and contrasting views on the use of mobile phone use in the classroom. While some educators and learners viewed the benefits of mobile learning in schools as illuminated by Steel and Keengwe (2012) and Bhargava (2014), other educators and learners expounded the challenges of allowing mobile phones in the classroom as illuminated by Kumar (2011) and Synott (2018).

6.4.4 Participants perception on whether distractions caused by mobile phones can be managed in the classroom (Research objective 4)

The quantitative phase (Phase 1) of the research shows that approximately 55% of educators felt that distractions caused by mobile phones in the classroom can be controlled (See Table 5.20). Approximately 63% of learners were of the opinion that distractions caused by mobile phones in the classroom can be controlled (See Table 5.21). The qualitative phase (Phase 2) gives meaning to and explores the results of the quantitative phase (Phase 1).

In the qualitative phase (Phase 2), it is clear from the outset that educators feel strongly that the usage of mobile phones in the classroom have to be implemented with restrictions and limits (See Table 6.15). Participants were asked to suggest how to manage the use of mobile phones to improve the quality of education.

An interesting observation made by Teacher F,

> '*When we introduced the calculator at school, we expected mathematics results to go up. Learners can't do basic arithmetic because they have become so lazy with the calculator. Some of them can't even use the calculator properly. We must not expect that using cell phones in the classroom will improve the quality of teaching and learning. It may make both educators and learners lazy. We must introduce it with care, but we must introduce it.'*

This statement resonates with Lisciandrello (2023) who says that learners can develop fluency and mental math skills without a calculator. Visual models and number sentences help learners find answers while also developing number sense, mental math, and problem-solving abilities. When learners become reliant on calculators, their fluency and number sense actually decline over time.

Learners mentioned that mobile phones must be used for a limited amount of time in classrooms,

‘*There must be time limits imposed on the usage of cell phones in the classroom and maybe only for certain subjects, not all. Perhaps teachers can be allowed to have one cell phone period a week with learners for their subject.’* (Learner 01)

‘There must be a roster or timetable for the usage of the cell phone in the classroom. I don’t think learners have the discipline or maturity, to use the cell phone correctly in the classroom and this can impact negatively on their learning.’ (Learner 08)

These statements echo Khalife (2017) and Lin and Li (2019) who warn that M-learning necessitates that learners spend time in front of a screen to learn. Screen time can be habit-forming, and, in some cases, addictive. Furthermore, M-learning must thus be regulated keeping in mind the other hours a learner spends in front of a screen.

The concluding analogy of Teacher D sums up the impact of the use of the mobile phone in the classroom on the quality of teaching and learning,

‘It’s like a knife you can use it to cut and hurt someone or perform an operation to heal someone. So, for me, mobile phones can be used positively, or it can be a means of destruction for the learner.’

6.5 CONCLUSION

This chapter began with a brief introduction to the purpose of the study, outlining the questions presented in chapter one. The research process for the qualitative phase (Phase 2) was explained, and the procedure followed described, and the steps to ensure trustworthiness defined. The data analysis explaining what the data collected from the interviews contained followed. This section started with the biographical data obtained from the participants, whether participants owned a mobile phone, educators’ number of years of experience and learners’ current grade in school. Thereafter the data analysis was presented in the form of seven subsections outlining the main themes of the data collected. The participants own words were used as much as

possible in order to improve the trustworthiness of the study. The interpretation of the study followed the analysis of the data. This section was broken up into seven headings which were formulated from the four sub-questions posted in chapter one and reviewed at the beginning of this chapter.

The empirical findings of the study, both quantitative (Phase 1) and qualitative (Phase2) were compared to the literature review conducted in Chapter Two and related to the Theoretical Framework presented in Chapter Three. It is very clear from early in the interviews that educators and learners do suffer from mild, moderate or severe forms of nomophobia. Educators felt it was very important for their families to have access to them in case of emergencies, while learners used their mobile phones to play games and relax.

It became increasingly evident as the interviews progressed that educators' and learners' felt that discipline was key to improving the quality of teaching and learning in the classroom. This form of discipline is critical in maintaining maturity to control the impact of mobile phone use in the classroom. Educators were vocal when they said that mobile phones would be beneficial in the classroom provided that certain controls and measures were put into place to manage the impact of mobile phone use in the classroom. It is with great excitement that I relate the empirical findings to the literature read and the theoretical framework.

Chapter 7 summarises the study and draws up the conclusion of the study. The findings of the study are discussed, recommendations are made and ideas for future studies are outlined.

CHAPTER SEVEN
SUMMARY, FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

7.1 INTRODUCTION

In the previous chapter, the research process for the qualitative phase (Phase 2) was explained, the procedure followed was described, and the steps to ensure trustworthiness were defined. Thereafter, the data analysis was presented in the form of seven subsections outlining the main themes of the data collected as presented in the questionnaire. The interpretation of the study followed the analysis of the data. This section was broken up into seven headings which were formulated from the four sub-questions posted in Chapter one (cf. par. 1.6). The empirical findings of the study, both quantitative (Phase 1) and qualitative (Phase2) were compared to the literature review conducted in Chapter Two and related to the Theoretical Framework presented in Chapter Three.

This chapter presents a summary of the major findings from the study as well as the conclusions, recommendations, and directions for further research. The chapter presents the implications of the findings for policy formulation in managing the impact of nomophobia on the quality of teaching and learning in Gauteng schools. It also outlines the significant lessons emanating from the study for the promotion among educators, learners and all other stakeholders in education to manage the use of mobile phones in Gauteng classrooms.

7.2 SUMMARY OF THE STUDY

This section gives a summary of the seven chapters of the study. The study explored managing the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. The study examined the use of mobile phones in the classroom and the perceived effect it would have on the quality of teaching and learning. The research design adopted was a highly flexible explanatory single site mixed methods case study design (cf. par. 4.3.5). To this end, the researcher conducted a literature review consisting of several types of publications.

The following sub-aims and objectives (cf. par. 1.7.) provided guidelines for the formulation and development of the research. The sub-aims or objectives of the study were to:

- Define and describe the concept of nomophobia.
- Determine if educators and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the impact or extent of nomophobia on teaching and learning in Gauteng schools.
- Discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

With these sub-aims and objectives and through the literature review, the researcher was able to identify and select an appropriate approach for conducting the study. Using the explanatory mixed methods approach, the data was collected through closed and open - ended questions in order to obtain an ontological perspective of the prevailing situation at the selected Gauteng school (the case). For the quantitative phase (Phase 1), the researcher collected data by adapting the Nomophobia Questionnaire (NMP-Q) (cf. par 4.7.2). The questionnaire used scaled items. For the qualitative phase (Phase 2), the researcher conducted one-on-one semi-structured interviews with the participants to elaborate on the quantitative data by sharing their views and thoughts regarding the management of the impact of nomophobia on the quality of teaching and learning in Gauteng schools (cf. par. 4.7.3).

The researcher selected one school (the single case) from all the Gauteng public secondary schools that have a ban on the use of mobile phones in the classroom. The researcher opted for a census approach within the case for the quantitative phase (Phase 1) (cf. par. 4.6.2). Primary quantitative data were collected through a survey that was conducted among educators and learners within the case (A Gauteng secondary public school). A total of 620 valid questionnaires were received and analysed (cf. par. 5.1). The qualitative data (for Phase 2) were collected from 21

participants. The 21 participants were made up of 15 learners (3 learners each from grade 8 to grade 12) and 6 educators that are in the Gauteng school (the case), where the use of mobile phones is banned.

Chapter One offered an orientation of the study. It highlighted the addiction to mobile phones commonly termed nomophobia. The introduction to the study also highlighted the learning opportunities created by mobile phone learning (cf. par. 1.1). Furthermore, the chapter provided the rational for the study (cf. par. 1.2), and the theoretical framework for the study (cf. par 1.3), as well as the preliminary literature review (cf. par. 1.4). The statement of the problem (cf. par. 1.5), the research question and hypotheses (cf. par. 1.6), the purpose, aims and objectives (cf. par. 1.7) of the study were also discussed. Briefly discussed within Chapter One was the research methodology (cf. par. 1.8) which included the research design (cf. par. 1.8.1), the research approach and paradigm (cf. par. 1.8.2), the population and sampling (cf. par. 1.8.3), instrumentation and data collection techniques (cf. par. 1.8.4), data analysis (cf. par. 1.8.5) and data presentation (cf. par. 1.8.6). The chapter discussed how reliability and validity in the quantitative phase would be achieved (cf. par. 1.9) and how credibility and trustworthiness in the qualitative phase would be established (cf. par. 1.10). The chapter incorporated a brief discussion of the considerations of research ethics (cf. par. 1.11), the limitations and delimitations of the study (cf. par. 1.12), the contribution of the study towards theory and practice (cf. par. 1.13), and a definition of the key concepts (cf. par. 1.14). A chapter outline (cf. par. 1.15) gave an insight into the expounding of the research. The summary (cf. par. 1.16) concluded the chapter.

Chapter Two undertook a literature study that explored the concept of nomophobia (cf. par. 2.2). The chapter examined developments in the concept of nomophobia (cf. par. 2.3) which included an in-depth study of nomophobia in the work environment (cf. par. 2.3.2), nomophobia in the school environment (cf. par. 2.3.3), nomophobia and learners (cf. par. 2.3.3.1) and nomophobia and educators (cf. par. 2.3.3.2). Furthermore, the effects of nomophobia on people (cf. par. 2.3.4) were explored and this included the psychological effects and symptoms (cf. par. 2.3.4.1), physical effects (cf. par. 2.3.4.2),

emotional effects (cf. par. 2.3.4.3) and the social effects (cf. par. 2.3.4.4). The introduction to the literature study concluded with an inspection of criteria to determine nomophobia (cf. par. 2.3.5). Next, the chapter explored theories of addiction (cf. par. 2.4) which encompassed negative reinforcement (cf. par. 2.4.1), positive reinforcement (cf. par. 2.4.3), the incentive salience model (cf. par. 2.4.4), the stimulus response learning model (cf. par. 2.4.5) and the inhibitory control dysfunction model (cf. par. 2.4.6). The chapter continued by examining the theories of teaching (cf. par. 2.5.2) and the theories of learning (cf. par. 2.5.3) applicable to the study which comprised of behaviorism (cf. par. 2.5.3.1), cognitivism (cf. par. 2.5.3.2), constructivism (cf. par. 2.5.3.3) and connectivism (cf. par. 2.5.3.4). The determinants of the quality of teaching and learning were investigated (cf. par. 2.6). The quality of learning (cf. par. 2.6.2) looked at defining quality (cf. par. 2.6.2.1), the use of indicators (cf. par. 2.6.2.2) and indicators for monitoring education quality (cf. par. 2.6.2.3). The quality of teaching (cf. par. 2.6.3) looked at creating a need to know in learners so they genuinely engage in learning (cf. par. 2.6.3.1), develop ways to engage a diversity of learners at the same time (cf. par. 2.6.3.2), draw out and use learners prior knowledge (cf. par. 2.6.3.3), conceptual understanding of content (cf. par. 2.6.3.4) and building trusting relationships and safe learning environments (cf. par. 2.6.3.5). The seven roles of an educator were discussed (cf. par. 2.6.4). The chapter unpacked mobile learning (M-learning) in the classroom (cf. par. 2.7). This included the history of m-learning (cf. par. 2.7.2), m-learning policies and practices in South African classrooms (cf. par. 2.7.3), benefits of mobile learning in the classroom (cf. par. 2.7.4) and challenges of mobile learning in the classroom (cf. par. 2.7.5). Lastly, the researcher discovered existing frameworks for managing the use of mobile phones in the classroom (cf. par. 2.8). The chapter concluded with a summary of the literature study (cf. par. 2.9).

Chapter Three focused on the theoretical framework for the study. The researcher answered the question ‘What is a theoretical framework?’ (cf. par. 3.2). The Network Society theory as a framework for this study was presented (cf. par. 3.3). Historical developments in The Network Society theory were examined (cf. par. 3.4). The historical developments encompassed the works of former Network Society ‘gurus’ (cf. par. 3.4.2) which highlighted the research of Wellman, Hiltz and Turoff (cf. par. 3.4.2.2),

Castells (cf. par. 3.4.2.3) and Van Dijk (cf. par. 3.4.2.3). The chapter went on to cite modern examples of Network Societies (cf. par. 3.5), the Network Society and its interaction with new media (cf. par. 3.6), the Network Society and social communication (cf. par. 3.7) and Network Societies in the work environment (cf. par. 3.8). Network Societies in the work environment included a visit to enterprise social networks (cf. par. 3.8.2) and consumer social networks (cf. par. 3.8.3). Furthermore, the chapter covered Network Society and education (cf. par. 3.9), inclusion and exclusion in the Network Society (cf. par. 3.10), power and empowerment in the Network Society (cf. par. 3.11) and finally criticisms against the Network Society (cf. par. 3.12). The chapter is summarized in the conclusion (cf. par. 3.13).

Chapter Four focused on the research methodology. The researcher revisited the purpose of the study (cf. par. 4.2) which included the research questions (cf. par. 4.2.1) and the study objectives (cf. par. 4.2.2). The chapter unfolded with a detailed description of the research design (cf. par. 4.3) and this encompassed a case study as a research strategy (cf. par. 4.3.2), the explanatory sequential research design (cf. par. 4.3.3), the significance of a mixed methods single case research (MMSCR) (cf. par. 4.3.5) and assumptions of the research design (cf. par. 4.3.6). The chapter presented the research approach (cf. par. 4.4) and the research paradigm (cf. par. 4.5). In addition, the population and sampling (cf. par. 4.6) were specified. This included a discussion of the study population (cf. par. 4.6.2) and census and sampling approaches in mixed methods single case research (MMSCR) (cf. par. 4.6.3). Instrumentation and data collection techniques (cf. par. 4.7) were examined, and this included instrumentation and data collection for Phase 1- the quantitative phase (cf. par. 4.7.2), instrumentation and data collection for Phase 2 – the qualitative phase (cf. par. 4.7.3), data processing (cf. par. 4.7.4) and data recording and management (cf. par. 4.7.5). Furthermore, the chapter disclosed data analysis (cf. par. 4.8) and data presentation (cf. par. 4.9) management. In the data presentation stage of the study, triangulation of the data from the two phases (cf. par. 4.9.4) was presented. The chapter discussion covered trustworthiness of the study (cf. par. 4.10) which incorporated validity and reliability of the quantitative data (Phase 1) (cf. par. 4.10.2) and credibility and trustworthiness of the qualitative methods (Phase 2) (cf. par.4.10.3). Strategies for

improving reliability of the quantitative phase (Phase 1) (cf. par. 4.10.4) and strategies for improving the trustworthiness of the qualitative phase (Phase 2) (cf. par. 4.10. 5) were also discussed. Finally, ethical issues related to the study (cf. par. 4.11) were considered. This included informed consent as a dialogue (cf. par. 4.11.1), confidentiality and anonymity (cf. par. 4.11.2), privacy and empowerment (cf. par. 4.11.3) and caring and fairness (cf. par. 4.11.4). Supporting Annexures were included in the chapter.

Chapter Five reported on the presentation and analysis of quantitative results. The chapter presented the sample characteristics (cf. par. 5.2) which included a biographical profile of subjects in the study (cf. par. 5.2.1) and descriptive statistics of the age variable (cf. par. 5.2.2). The chapter presented measuring respondent's levels of nomophobia (Research objective 2) (cf. par. 5.3) by examining respondent's agreement with the statements (cf. par. 5.3.1) and calculating the extent of nomophobia among respondents (cf. par. 5.3.2). In addition, the chapter presented measuring respondents' perceptions on the use of mobile phones on the quality of teaching and learning (Research objective 3) (cf. par. 5.4) by examining agreement with statements on the use of mobile phones and the quality of teaching (cf. par. 5.4.1) and agreement with statements on the use of mobile phones and the quality of learning (cf. par. 5.4.3). Furthermore, agreement with statements on managing the impact of mobile phone use (Research objective 4) (cf. par. 5.5) were examined. Finally, construct level correlations and group differences (cf. par. 5.6) and analysis of variance between subjects (cf. par. 5.7) were presented.

Chapter Six reported on the presentation and analysis of qualitative results. The chapter examined the research process (cf. par. 6.2) and went on to the data presentation and analysis (cf. par. 6.3). This incorporated the biographical details of the participants (cf. par. 6.3.2) and analysis of data obtained from the interviews (cf. par. 6.3.3). The chapter presented participants perceptions on access to information (cf. par. 6.3.3.1), giving up convenience (cf. par. 6.3.3.2), not being able to communicate (cf. par. 6.3.3.3), losing connectedness (cf. par. 6.3.3.4), the quality of teaching (cf. par. 6.3.3.5), the quality of learning (cf. par. 6.3.3.6) and managing the use of mobile phones

to improve the quality of education (cf. par. 6.3.3.7). Additionally, data interpretation – integration of Phase 1 and Phase 2 (cf. par. 6.4) was undertaken. This incorporated participants' perceptions on the usage of their mobile phones (Research objective 2) (cf. par. 6.4.2), participants' perceptions on the impact of mobile phone use in the classroom on the quality of teaching and learning (Research objective 3) (cf. par. 6.4.3) and participants' perception on whether distractions caused by mobile phones can be managed in the classroom (Research objective 4) (cf. par. 6.4.4). The quantitative phase (Phase 1) and the qualitative phase (Phase 2) were merged. Hence, the reliability of the study was established.

Chapter Seven is the concluding chapter and discloses the summary, findings, recommendations and conclusions for managing the impact of nomophobia on the quality of teaching and learning in Gauteng classrooms. The development of these recommendations is the researcher's contribution to both theory and practice in this field. Finally, the chapter made comparisons and connections between the findings of the research and the literature review and the theoretical framework.

7.3 FINDINGS FROM THE STUDY

The study was designed around the following research question stated in Chapter One, Section 1.6:

'How can the impact of nomophobia on the quality of teaching and learning in Gauteng schools be managed?'

Based on this research question, four sub-questions were derived. This section gives a summary of the key findings that emerged for each sub-question. Each sub question had a corresponding sub-aim (cf. par. 1.6 and 1.7). This section compelled the researcher to look back at the literature review in Chapter Two and the theoretical Framework in Chapter Three and compare it with the data analysed in, Chapter 5 (the quantitative phase – Phase 1) and Chapter Six (the qualitative phase – Phase 2), and subsequently draw conclusions. The findings of each sub-question and the sub-aims are therefore discussed as presented below.

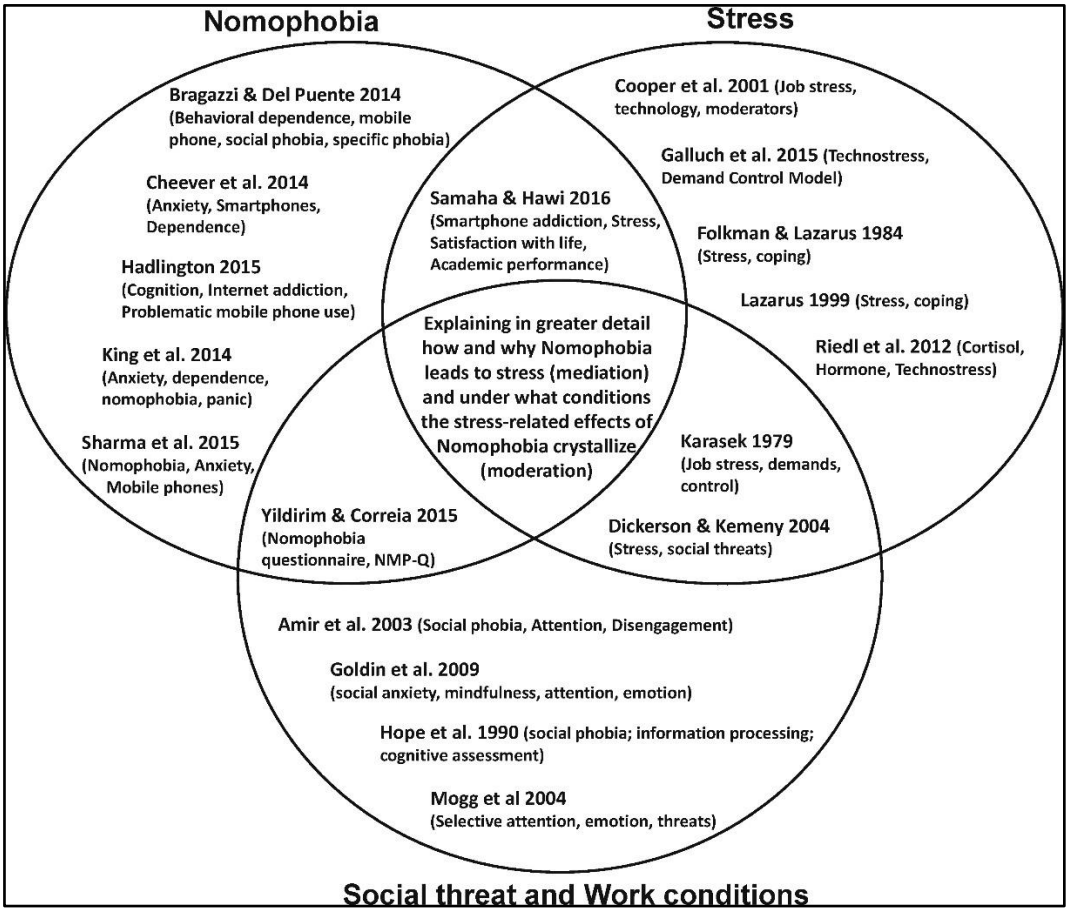
7.3.1 Findings for sub-question one and sub-aim one

Based on the first sub-question, the purpose of the first sub-aim of the study was to define and describe the concept of nomophobia and how it can be overcome. Different researchers define the concept of nomophobia using different terminology and the definition is not standardized. How to overcome nomophobia will be dealt with in the recommendations part of the study. The literature study in Chapter Two guided this part of the study.

The following key findings emerged (cf. par 2.2):

- Nomophobia (short for 'no mobile phobia') is the fear of, or anxiety caused by not having a working mobile phone. The anxiety of not having a working mobile phone can lead to panic attacks and other psychological disorders (cf. par. 2.2).
- Nomophobia has been referred to as dependence on mobile phones or an addiction to mobile phones. It is defined as the feelings of discomfort, anxiety, nervousness or distress that result from being out of contact with a mobile phone. Nomophobia is the irrational fear of being without a mobile phone or being unable to use a mobile phone for some reason (cf. par. 2.2).
- The DSM-5 Anxiety work group has proposed to consider the inclusion of nomophobia in the DSM-5 (cf. par. 2.3.4). Nomophobia can be considered an addiction which is used to refer to a chronic condition where there is an unhealthily powerful motivation to engage in a particular behavior (cf. par. 2.4.1).
- The size and convenience of mobile phones means that they can be taken anywhere and satisfy compulsions at any time.
- Figure 7. 1 is an illustration of the overlap of the concepts of nomophobia, stress, social threat and work conditions. The illustration integrates the work of different authors and shows the overlap of their work too.

Figure 7. 1: Illustrative studies in the context of nomophobia, stress, and social threat as well as work conditions (Adapted from Tams, Legoux & Leger, 2018)



7.3.2 Findings for sub-question two and sub-aim two.

Based on sub-question two, the purpose of sub-aim two was to determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.

The following major findings emerged:

- The quantitative phase (Phase 1) of the study revealed that prevalence of nomophobia by severity among educators and learners was 0 % for absence of nomophobia, 15.9 % respondents displayed a mild level of nomophobia, 57.9 % of respondents displayed a moderate level of nomophobia and more than a third of respondents (36.7 %) displayed severe nomophobia (cf. par. 5.3.2).

- The quantitative phase (Phase 1) further revealed that educators displayed higher levels of nomophobia as compared to learners (cf. par. 5.3.2).
- The qualitative phase (Phase 2) elaborated on and gave meaning to the quantitative phase (Phase 1). The qualitative phase (Phase 2) indicated that educators use their mobile phones for work related information. Mobile phones allow them to stay in touch with people from work, their families and friends (cf. par. 6.3.3.1). Educators do feel uncomfortable without access to the information that they regularly check up on and by their own admission do spend a lot of time on their mobile phones.
- Unlike educators, learners have an affinity for games and spend a lot of time playing these games. Learners admitted being addicted to the games. Furthermore, learners used their mobile phones to access resources for schoolwork, and to keep in touch with family and friends (cf. par. 6.3.3.1).
- Educators and learners prefer face to face communication (cf. par. 6.3.3.3).
- Educators are not keen followers of social media websites and while learners follow social media websites, they do not spend too much time on it (cf. par. 6.3.3.4).

7.3.3 Findings for sub-question three and sub-aim three.

Based on sub-question three, the purpose of sub-aim three was to establish the impact or extent of nomophobia on teaching and learning in Gauteng schools.

The key findings are as follows:

- The quantitative phase (Phase 1) of the study revealed that more than 75% of educators (75,8%) agreed with the statement ‘Teachers can improve the lesson if they can use their mobile phones in the classroom’ compared to the percentage of learners that agreed with the statement (54,9%). However, more learners (79,2%) agreed with the statement, ‘Teachers can use websites to explain topics they are not familiar with’ as compared to educators’ responses (78,8%). Approximately half of the teachers (51,5%) agreed with the statement

‘I feel teachers would be distracted with a mobile phone in the classroom’ as compared to learners (46,2%). This indicates that educators and learners feel that a mobile phone in the classroom can be a useful educational resource, but they also seem to be weary of the fact that there can be distractions that emanate from the use of mobile phones in the classroom. It is therefore evident from the statistics that respondents generally reported a moderate level of acceptance for the use of mobile phones in the classroom to improve the quality of teaching (cf. par. 5.4.1).

- The quantitative phase (Phase 1) also revealed that less than half the teachers (45,5%) agreed with the statements ‘If learners are allowed to have mobile phones in the classroom it can improve the quality of learning”, and the statement ‘If learners have mobile phones in the classroom, it will encourage sharing of knowledge’ (45,5%). This is in comparison to learners where almost a third of the learners agreed with these statements (62,0% and 67,6%). More than half the teachers (54,5%) and more than three quarters of learners (76,5%) agreed with the statement ‘If learners have mobile phones in the classroom extension activities can be given from websites.’ It is therefore evident from the statistics that respondents generally reported a moderate to high level of level of acceptance for the use of mobile phones in the classroom to improve the quality of learning. The results as reported indicated that the usage of mobile phones in the classroom and the quality of learning seemed not to be consistent across educators and learners with significant differences reported in mean levels (cf. par. 5.4.3).
- The qualitative phase (Phase 2) gave meaning to the quantitative phase (Phase 1). Educators and learners overlapped with their responses on what constituted a good quality of teaching and learning. The researcher summed up all the responses. Educators and learners were vocal about the importance of discipline for a good quality teaching and learning. Other factors that educators and learners cited as being important in determining if education is of a high standard were high stake exams; access to information and resources; teachers who plan their lessons and are prepared; learners that are focused; having

proper controls in place and putting into place certain parameters for using mobile phones in the classroom; educators understanding of the learners; dedication of the educator; having an engaged class and parental involvement (cf. par. 6.3.3.5 and 6.3.3.6)

7.3.4 Findings for sub-question four and sub-aim four.

Based on sub-question four, the purpose of sub-aim four was to discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

The key findings are as follows:

- The quantitative phase (Phase 1) of the study merely suggested whether distractions caused by mobile phones in the classroom can be managed. It was revealed that more than half the educators (54.5%) agreed with the statement 'Distractions caused by mobile phones in the classroom can be controlled,' while almost two-thirds (63.4%) of the learners agreed with the statement (cf. par. 5.5). It is therefore evident that respondents generally reported a high level of acceptance for managing the impact of mobile phone distractions in the classroom. The results as reported indicated that managing the impact of mobile phone use in the classroom seemed to be consistent across educators and learners (cf. par 5.5).
- Furthermore, the quantitative phase (Phase 1) indicated that as educators' personal perceptions of nomophobia increase, the use of mobile phones on the quality of learning decreases (cf. par. 5.6). Also, as educators' personal perceptions of nomophobia increase, managing the impact of mobile phone use decreases (cf. par. 5.6). However, learners felt that the use of mobile phones on the quality of learning increases as managing the impact of mobile phone use in the classroom increases (cf. par. 5.6).
- The qualitative phase (Phase 2) of the study gave meaning to the quantitative phase (Phase 1). The qualitative phase (Phase 2) of the study revealed that

educators acknowledged that mobile phones have an important role to play in education, but they all stressed the importance of having proper protocols in place for the use of mobile phones to be beneficial in education (cf. par. 6.3.3.6). Learners, however, were not too keen on having mobile phones in the classroom. Learners reiterated that if mobile phones are used in the classroom there must be controls over access to certain websites. Learners mentioned having a limited amount of time spent on mobile phones in the classroom. Once again, learners and educators spoke about self-discipline when managing the use of mobile phones in education (cf. par. 6.3.3.6).

7.4 RECOMMENDATIONS FROM THE STUDY

In response to the findings arising from the study, the following recommendations are presented and offered for policy formulation and improvement of existing policies at provincial and national level in the Department of Education. The recommendations emanate from the research as well as from findings in the literature. These are arranged in the same order as the sub-questions and sub-aims and their corresponding findings.

7.4.1 Recommendations for sub-question one

Nomophobia might not yet be classified as an official mental health condition. However, experts agree this issue of the technology age is a growing concern that can affect mental health. A phobia can be treated by a therapist using (Legg & Raypole, 2019; Cherry K, 2020) (cf. par. 2.8.2):

- **Cognitive behavioral therapy –** this can help a person to manage negative thoughts and feelings that arise when a person thinks about not having their mobile phone.
- **Exposure therapy –** this can help a person to face their fears through gradual exposure to it. If a person has nomophobia, they will slowly get used to the experience of not having their phone. This may seem frightening at first, especially if one needs their phone to stay in touch with loved ones, but the goal of exposure therapy isn't to completely avoid using one's mobile phone; instead,

it helps one learn to address the extreme fear that one experiences when one thinks about not having one's phone. Managing this fear can help a person use their phone in healthier ways.

- **Medication -** Medication can help a person to deal with severe symptoms of nomophobia, but it doesn't treat the root cause. It's usually not helpful to treat a phobia with medication alone. Depending on the symptoms, a psychiatrist may recommend using medication for a short time as one learns to cope with one's symptoms in therapy.

A person can also take steps to cope with nomophobia on their own by trying the following (Munoz, 2018; Legg & Raypole, 2019; Cherry, 2020) (cf. par. 2.8.2):

- Mobile phones should be switched off at night to get more restful sleep. If an alarm is needed to wake up, keep the phone at a distance, far enough away that it can't easily be checked at night.
- Try leaving mobile phones at home for short periods of time, such as when you make a grocery run, pick up dinner, or take a walk (cf. par. 6.3.3.2).
- Spend some time each day away from all technology. Try sitting quietly, writing a letter, taking a walk, or exploring a new outdoor area (cf. par. 6.3.3.3).

Some people feel so connected to their phones because they use them to maintain contact with friends and loved ones. This can make it tough to take space from your phone, but consider doing the following (Legg & Raypole, 2019) (cf. par. 6.3.3.3):

- Encourage friends and loved ones to have in-person interactions, if possible. Host a meetup, take a walk, or plan a weekend getaway.
- If your loved ones live in different cities or countries, try to balance the time you spend on your phone with other activities. Set aside a period of time each day when you turn off your phone and focus on something else.
- Try to have more in-person interactions with people physically near you. Have a short conversation with a co-worker, chat with a classmate or neighbor, or compliment someone's outfit. These connections might not lead to friendships — but they could.

7.4.2 Recommendations for sub-question two

It is evident from the findings that educators and learners do suffer from mild, moderate and severe nomophobia. Nomophobia affects the quality of work delivered by both educators and learners. The Department of Education must recognize that nomophobia does affect teaching and learning and must provide counselling therapists for educators and learners alike. Furthermore, a policy for the use of mobile phones must be introduced for both educators and learners.

7.4.2.1 Framework for mobile phone policy for educators

The framework policy for educators must be designed to inform all educators of expectations regarding the use of mobile phones during working hours. It is intended to offer guidance to educators with regard to what constitutes appropriate (and inappropriate) use of mobile phones within the workplace. Key principles of the policy should include (cf. par. 2.8.1):

- Mobile phones must not be used for private or personal use during lessons or in formal school time. They should be switched off (or set to silent) at all times.
- Use of mobile phones by educators during working hours for social networking activity (other than in accordance with curriculum use) is strictly prohibited.
- Mobile phones are not permitted to be used in certain designated areas within the school premises such as changing rooms and toilets.
- Educators are not permitted to use their own mobile phones for contacting learners or their families in a professional capacity (either on or off duty) other than in an emergency. In this contingency, educators should (wherever practicable) be issued with a school phone for this specific purpose.

The policy must explain that the use of mobile phones by educators for the purpose of making or receiving personal calls and/or texts, tweets etc during the working day is discouraged for the following reasons:

- It does not set a professional and positive example to pupils and parents.

- It is disruptive and interrupts lessons.
- It is often discourteous to colleagues (e.g., during meetings).
- It is a misuse of the school's time and has potential to impact adversely on the learners' learning.

Furthermore, educators are not at any time permitted to use recording equipment on their mobile phones, for example, to take recordings of children, or sharing images. Legitimate recordings and photographs should be captured using school equipment such as cameras and iPad. The policy must explain that:

- Educators should have their phones on silent or switched off and out of sight (e.g., in a drawer, handbag or pocket) during class time.
- Mobile phones should not be used in a space where children are present (e.g., classroom, playground).
- Use of phones (inc. receiving/sending texts and emails) should be limited to non-contact time when no children are present e.g., in office areas, staff room or empty classrooms.

There must be consequences if educators breach the mobile phone policy, and this would include being invited to an investigatory meeting to ascertain the facts and details about the incident. Thereafter, disciplinary measures will be taken.

7.4.2.2 Framework for mobile phone policy for learners

Developing a mobile phone policy at school is essential to ensure learners and educators are able to enjoy the instructional benefits associated with using mobile phones, while also ensuring the mobile phones don't become a distraction from learning. The policy for learners must be designed to inform all learners of expectations regarding the use of mobile phones in the classroom. It is intended to offer guidance to learners with regard to what constitutes appropriate (and inappropriate) use of mobile phones within the school. Key principles of the policy should include (cf. par. 2.8.1):

- Mobile phones may be used on school grounds before school, during lunch, and after school.
- Mobile phone use is prohibited in classrooms, restrooms, and school offices, unless otherwise stated by a teacher.
- During the instructional day, mobile phones must remain out of sight and in silent mode.
- Unless explicitly allowed by an educator, headphones and other listening devices may only be used before and after school hours.
- Mobile phones must be placed in lockers, backpacks, or another location away from learners and their desks during tests and assessments.
- If learners need to place an emergency phone call during the day, they should request to go to the main office to use an office phone.
- Learners may be subject to disciplinary action if their use of their mobile phone disrupts the school's educational environment. Examples of this include, but are not limited to cheating, bullying, harassment, unlawful recording or photographing, or violating other school rules.
- The school and its staff are not responsible for any damage to or theft of a learner's mobile phone. Learners must properly secure and take care of their own phones.
- Learners and their parents must read the mobile phone policy and return a signed copy to the office at the beginning of the school year. Signing the policy acknowledges acceptance. Learners will not be permitted to have their phones at school until the signed policy is returned.

If learners violate the school's mobile phone policy, the following may occur:

- First offense: The learner's mobile phone will be confiscated by a staff member and held in the main office until the end of the school day. Before being allowed to pick up their phone at the end of the day, learners must discuss and review the mobile phone policy with a staff member.

- Second offense: The learner's cell phone will be confiscated and held in the main office until the end of the school day. The learner's parents will be contacted and informed of the refusal to follow the school's mobile phone policy. Learners may pick up their phones following after-school detention.
- Third offense: The learner's mobile phone will be confiscated and held in the main office until the learner's parents are able to come to pick it up. The learner will receive after-school detention and will be prohibited from bringing their mobile phone back on school grounds for two weeks.

The school administration will reserve the right to adjust these consequences on a case-by-case basis if needed. For example, extreme behaviours that break the law or engaging in bullying or harassment of other learners may result in suspension or expulsion.

7.4.3 Recommendations for sub-question three

The right mobile phone policy at school can help learners learn and reduce distractions. When learners are able to use their mobile phones appropriately during instruction, they can be powerful technological tools for researching, engaging with a lesson, providing feedback to peers, participating in classroom surveys, and more. The best mobile phone policies also prevent learners from pulling out their phones during inappropriate times, which can distract them from learning. Educators can maintain mobile phone management in the classroom by (cf. par. 2.8.3):

- **Purchasing or making their own mobile phone charging station -** A mobile phone charging station and storage organizer can provide learners with an acceptable place to keep their mobile phones when they are not needed for instruction. Educators can add charging cables or allow learners to bring their own chargers, to ensure their phones are ready to use when needed for instruction.
- **Educators can use a pocket chart or hanging shoe organizer -** Number each slot on the organizer and assign each learner a number. When learners enter the classroom, they can place their phones in the slot with their numbers. This

will also help prevent learners from getting distracted by their phones during instruction.

- **Create a 'Cell Phone Jail' -** Educators can make a classroom cell phone jail where the phones of learners who aren't complying with the mobile phone policy can go for the rest of the class period. If an educator sees a learner using their phone, ask them to place their phone in 'jail' for the remainder of the period.
- **Use positive reinforcement -** Rather than only reprimanding learners that have their phones out when they shouldn't be out, give praise or classroom rewards to the learners who consistently follow the mobile phone policy.
- **Create a classroom signal for cell phone use -** Sometimes learners need to use their mobile phones just for a moment to look up an unknown word, find a synonym, or review a topic. There may be times when an educator is willing to permit such use, and other times when the educator is not, such as during a test. Create a classroom hand signal that learners can use to ask for permission without disrupting instruction or other learners that are working. The educator can either give learners a thumbs up to go ahead and use their mobile phone or a thumbs down to let them know that now is not an acceptable time to have it out (cf. par. 6.3.3.7).
- **Work in a few cell phone breaks during the day -** Setting aside just two or three minutes during a class period where learners are allowed to use their mobile phones may make it less likely for them to try to sneak them out during other parts of the day. This can reduce distractions and help learners focus on instruction (cf. par. 6.3.3.7).

7.4.4 Recommendations for sub-question four

The use of mobile phones in schools is not going to go away, so learning to effectively manage and handle them is a valuable skill for educators and learners to learn. This change in the way we interact with technology and integrate it into our lives has come dramatically and fast. It's sometimes hard for educators, many of whom grew up in an era with no mobile phones or even the internet, to adapt to this fast-paced technological generation. While mobile phones can easily be the downfall of your learners' attention

spans and performance, they don't have to be. More and more educators these days are incorporating modern technology and learners' own mobile phones into their classroom to engage and excite learners about learning. Educators must:

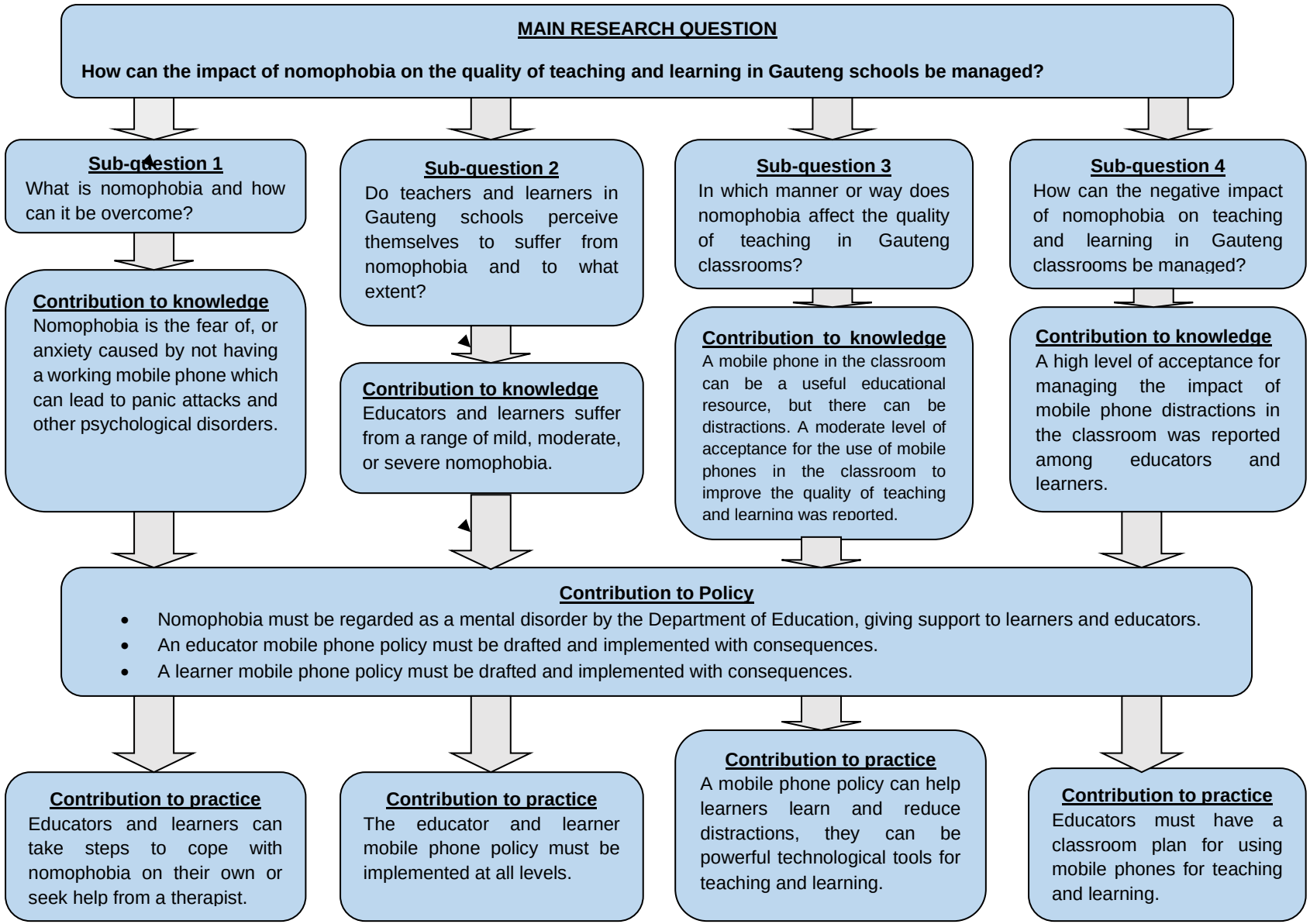
- **Establish Expectations -** At the beginning of the school year, it's a good idea for educators to be blunt with learners about what is expected of them when it comes to using their mobile phones in class. This is also the time to tell learners about any plans to incorporate technology into the classroom. The best way to create a set of rules when it comes to mobile phone usage is to do it together with the learners. Set aside a class period at the beginning of the year where educators and learners talk about the best way to keep their attention focused on classwork. Include a clear list of times that it is and isn't appropriate to be using learners' phones in class. It's also important to agree on and clearly lay out the consequences of breaking the rules. Educators can even write up a contract or agreement laying out all of the expectations that have been agreed upon as a class, and have learners read it over and sign it. This way learners know what to expect, and there are no surprises when they're caught using their mobile phones (cf. par. 6.3.3.5).
- **Educators must engage their learners with technology -** The best way to manage mobile phones isn't to ignore them, but to use it as an educational tool. Engaging learners by allowing them to use their own or mobile phones in an educational setting can bring diversity to the curriculum and keep the interest of even the most distraction-prone learners (cf. par. 6.4.4 and cf. par. 1.4).
- **Take the time to walk around the classroom -** It's hard to tell whether or not learners are staying on task when educators can't see their screens. Educators can easily fix this by increasing the time they dedicate to walking around the classroom. If learners know that educators are likely to come their way with little to no warning, they're more likely to stay on task. Educators can also tell who is busy with other distractions on their mobile phone, by those that exit out of tabs quickly or double tap their home screen when they realize an educator is walking by (cf. par. 6.4.3.2).

- **Don’t be afraid to take them away -** It’s just as important to engage learners with technology as it is to give them a break from it. They’re on their phone all day every day, at school and at home. While they may not be fans of the idea, it may be beneficial to both their attention spans and mental health to designate a technology-free period of time (cf. par. 6.4.3).
- **Be a good role model –** if the educator is constantly on the mobile phone, the educator cannot be a good role model to the learners (cf. par.2.3.3.2).

7.5 CONTRIBUTIONS OF THE STUDY

The contributions to the study are stated below according to each area of contribution, namely, contributions to knowledge, policy and practice. For the sub-section contribution to knowledge, the researcher has attempted to match the sub-question to the contribution. For the policy and practice section there is some overlapping, and it has been dealt with in totality, as illustrated in Figure 7.2 below.

Figure 7. 2: Summarised illustration of study's contributions



7.5.1 Contributions to knowledge

This study contributes to knowledge in several ways that will benefit Gauteng schools that have a ban on the use of mobile phones as delineated in the following sub-sections. The literature study revealed that no studies apparently had been carried out on educators by other researchers in Gauteng schools or anywhere (cf. par. 1.2). Also, very little apparently, has been researched about international learners' adjustment at private universities in Ghana (cf. par. 1.10). Thus, the findings of this study would be beneficial to the secondary public-school community – learners, educators, administrators and beyond. Through this study, educators and learners' orientation can be enriched from the information which would be presented to the Department of Education. Also, workshops can be held to enlighten the educators on what challenges they are likely to encounter in trying to manage the use of mobile phones in the classroom to improve the quality of teaching and learning. The administrators at the Department of Education on the other hand can assist the educators in coping with or overcoming the challenges. Specifically, some of the recommendations stated above could then be implemented.

Furthermore, since information on the topic appears to be very limited in South Africa (cf. par.1.3) this study can be a modest contribution to the discussion. The study can contribute to curriculum development for other secondary public schools by creating the awareness of the need to be cognizant in the area of coping mechanisms with nomophobia among educators and learners in order to improve the quality of teaching and learning in Gauteng classrooms.

7.5.1.1 Contributions to knowledge for sub-question one.

The findings for sub-question one contributes the following knowledge:

- Nomophobia might not yet be classified as an official mental health condition. However, experts agree this issue of the technology age is a growing concern that can affect mental health.

- The DSM-5 Anxiety work group has proposed to consider the inclusion of nomophobia in the DSM-5 (cf. par. 2.3.4). Nomophobia can be considered an addiction which is used to refer to a chronic condition where there is an unhealthily powerful motivation to engage in a particular behavior (cf. par. 2.4.1).
- Educators and learners should try to cope with nomophobia on their own and if they cannot then they should reach out for help by getting treatment from a therapist. In this regard, the Department of Education should provide counselling or assistance as they do with other challenges faced by educators and learners.

7.5.1.2 Contributions to knowledge for sub-question two.

The findings for sub-question two contributes the following knowledge:

- The prevalence of nomophobia by severity among educators and learners was 0 % for absence of nomophobia, as 15.9 % respondents displayed a mild level of nomophobia, 57.9 % of respondents displayed a moderate level of nomophobia and more than a third of respondents (36.7 %) displayed severe nomophobia. It is clear that educators and learners display some form of nomophobia (cf. par. 5.3.2).
- Educators displayed higher levels of nomophobia as compared to learners (cf. par. 5.3.2).
- Educators use their mobile phones for work related information. Mobile phones allow them to stay in touch with people from work, their families and friends (cf. par. 6.3.3.1). Educators do feel uncomfortable without access to the information that they regularly check up on and by their own admission do spend a lot of time on their mobile phones.
- Learners have an affinity for games and spend a lot of time playing these games. Learners admitted being addicted to the games. Furthermore, learners used their mobile phones to access resources for schoolwork, and to keep in touch with family and friends (cf. par. 6.3.3.1).
- Educators and learners prefer face to face communication (cf. par. 6.3.3.3).

- Educators are not keen followers of social media websites and while learners do follow social media websites, they do not spend too much time on it (cf. par. 6.3.3.4).

7.5.1.3 Contributions to knowledge for sub-question three.

The findings for sub-question three contributes the following knowledge:

- Educators and learners feel that a mobile phone in the classroom can be a useful educational resource, but they also seem to be weary of the fact that there can be distractions that emanate from the use of mobile phones in the classroom. It is therefore evident from the statistics that respondents generally reported a moderate level of acceptance for the use of mobile phones in the classroom to improve the quality of teaching (cf. par. 5.4.1).
- Educators and learners generally reported a moderate to high level of acceptance for the use of mobile phones in the classroom to improve the quality of learning. Furthermore, the usage of mobile phones in the classroom and the quality of learning seemed not to be consistent across educators and learners (cf. par. 5.4.3).
- Educators and learners cited as being important in determining if education is of a high standard were discipline; high stake exams; access to information and resources; teachers who plan their lessons and are prepared; learners that are focused; having proper controls in place and putting into place certain parameters for using mobile phones in the classroom; educators understanding of the learners; dedication of the educator; having an engaged class and parental involvement (cf. par. 6.3.3.5 and 6.3.3.6).

7.5.1.4 Contributions to knowledge for sub-question four.

The findings for sub-question four contributes the following knowledge:

- Educators and learners generally reported a high level of acceptance for managing the impact of mobile phone distractions in the classroom. Managing

the impact of mobile phone use in the classroom seemed to be consistent across educators and learners (cf. par 5.5).

- As educators' personal perceptions of nomophobia increase, the use of mobile phones on the quality of learning decreases (cf. par. 5.6). Also, as educators' personal perceptions of nomophobia increase, managing the impact of mobile phone use decreases (cf. par. 5.6). However, learners felt that the use of mobile phones on the quality of learning increases as managing the impact of mobile phone use in the classroom increases (cf. par. 5.6).
- Educators acknowledged that mobile phones have an important role to play in education, but they all stressed the importance of having proper protocols in place for the use of mobile phones to be beneficial in education (cf. par. 6.3.3.6). Learners, however, were not too keen on having mobile phones in the classroom. Learners reiterated that if mobile phones are used in the classroom there must be controls over access to certain websites. Learners mentioned having a limited amount of time spent on mobile phones in the classroom. Once again, learners and educators spoke about self-discipline when managing the use of mobile phones in education (cf. par. 6.3.3.6).

7.5.1 Contributions to policy

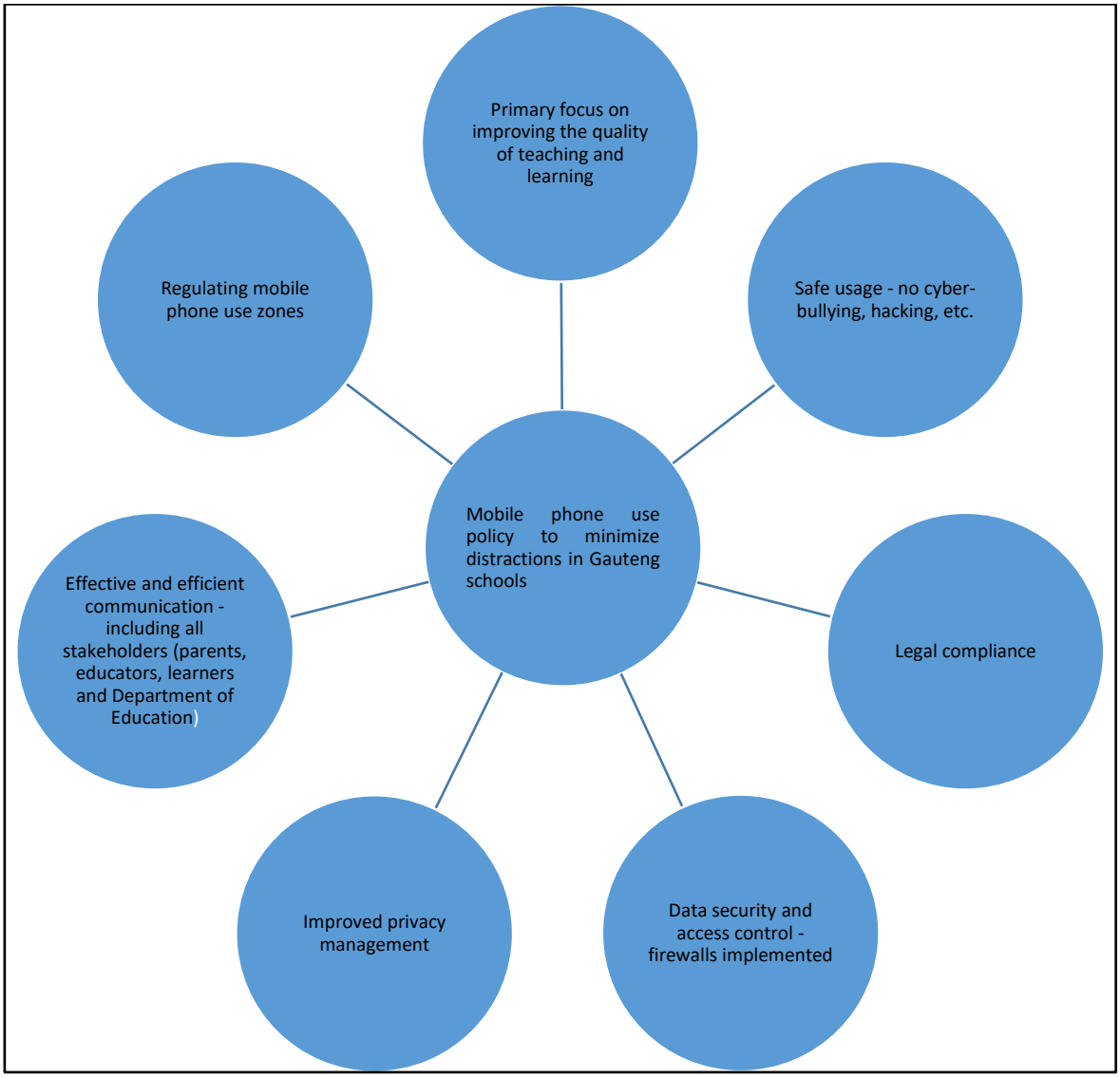
This study can contribute to policy when the Department of Education realises that educators and learners' mobile phones can be an important educational resource. Mobile phone policies can be introduced to ensure greater sensitivity and responsiveness to deal with M-learning in the classroom. Furthermore, the Department of education and other stakeholders must recognise that nomophobia can be a real addiction which can affect teaching and learning and for which support is required.

New policies should be direct outcomes of the recommendations given in this chapter. In this way, the study can also contribute to improving the quality of teaching and learning of secondary public schools in Gauteng and in South Africa in general. This section is not arranged according to specific sub-questions as the policies address all areas of the study.

There should be policies at National level, Provincial level, district level and school level to regulate the use of mobile phones in schools.

Figure 7. 3 is a visual framework for mobile phone policy implementation for educators and learners.

Figure 7. 3 :Visual framework for mobile phone policy implementation for educators and learners



7.5.2 Contributions to practice

This study contributes to practice in several ways that will benefit Gauteng schools and education at large. An educator and learner mobile phone policy can be developed from the findings and recommendations of the study. The following steps are a pilot action plan for its implementation with the final step being the development of a national educator mobile phone policy in the classroom and a learner mobile phone policy in the classroom. The two can culminate in a handbook that can be distributed to educators and learners. Currently, there is no national standard approach or guidelines in

Gauteng for managing the use of mobile phones in the classroom. The existing mobile phone policy for learners is evidently inadequate as there is no specific mention of managing the impact of mobile phone use on the quality of teaching and learning (cf. par. 2.7.3). Thus, there is the need for a coordinated and coherent mobile phone policy for educators and learners to reduce the impact of nomophobia in Gauteng classrooms and thus improve the quality of teaching and learning. The implementation of these policies will be discussed and developed during a series of Coordination Forums with all stakeholders present.

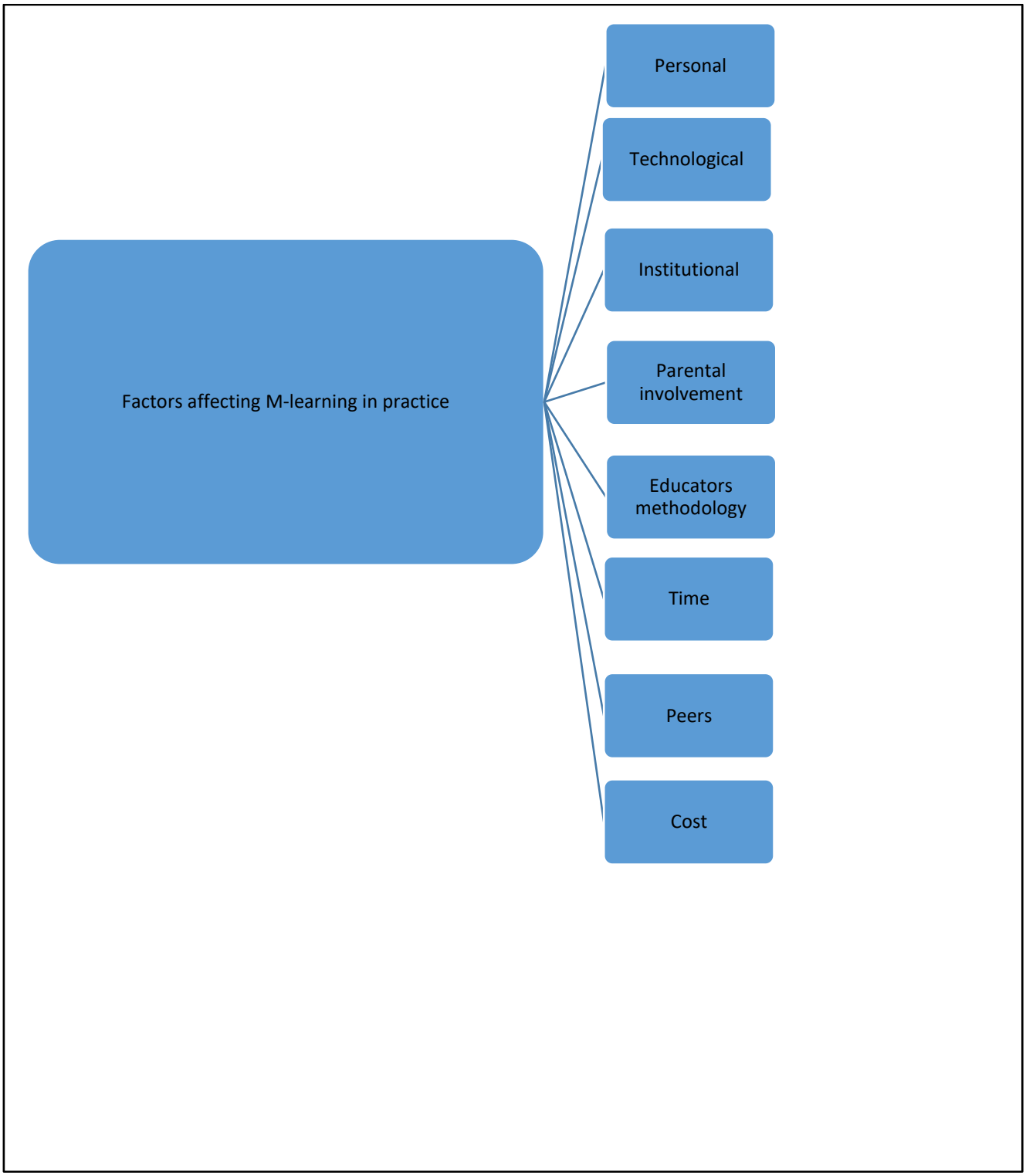
The first step in the implementation of managing the use mobile phones in Gauteng classrooms is setting up a Mobile Phone Coordination Forum. A Mobile Phone Coordination Forum would ensure a strategy for the management of the use of mobile phones in Gauteng classrooms. The Forum will help the various stakeholders in the education arena to work together. Relevant information from the various stakeholders that could affect the educators and learners would be shared during this Forum. Thus, other arms of administration, such as the national office, provincial office, district office, trade unions, school governing bodies, parents, educators and learners would be able to give their inputs and recommendations for the management of the use of mobile phones in the classroom (cf. par. 2.8.4.2).

This study has the potential to help educators in understanding the needs of learners, and similarly, the study has the potential to help administrators to understand the needs of educators. Thus, during the Forum, all stakeholders would be equipped with the needed sensitivity to empathetically view nomophobia as a possible mental disorder, and to act appropriately when dealing with educators and learners who do have some form of nomophobia (cf. par. 2.3.4). Additionally, all stakeholders must view the use of mobile phones for educational purposes in a positive light to enable a positive impact on the quality of teaching and learning (cf. par. 2.7.4).

To promote the use of M-learning in the classroom, the school should have educators that are not only well trained in communication skills but are also passionate and caring enough to willingly assist learners (cf. par. 6.3.3.6). As the literature and the qualitative

phase indicated, the academic environment has some bearing on the academic performance and academic motivation of learners (cf. par. 2.6.3.2 and cf. par. 6.3.3.5). Educators will be encouraged to be more flexible during their instructional hours and will be trained to use various communication styles and behaviors to ensure learners are not distracted when using mobile phones in the classroom (cf. par. 6.3.3.5). Additionally, educators will make learners understand that discipline in the classroom is all about setting boundaries and limits and these limits and boundaries must be extended beyond the classroom to control nomophobia (cf. par. 6.3.3.5). Figure 7.4 shows the factors affecting M-learning in the classroom.

Figure 7. 4 : Factors affecting M-learning in practice.



7.6 AVENUES FOR FURTHER RESEARCH

Although each of the four sub-aims were achieved, clearly acknowledging the limitations of the study and using the results as a basis, there are two suggestions for further studies on the topic.

First, following the extent of nomophobia among educators and learners in the case (a single Gauteng public secondary school), it is imperative that further research is conducted with other schools, both nationally and internationally, among other educators and learners in general to see the levels of nomophobia. Furthermore, it would be interesting to see the responses of educators and learners of private schools too. This approach could make the results more generalizable for the institution.

Second, the study was limited to a school that imposes a ban on the use of mobile phones in the classroom. It would be interesting to see how schools that allow mobile phones in the classroom manage the challenges of having a mobile phone in the classroom. Furthermore, schools that allow mobile phones in their classrooms must show how the quality of teaching and learning has improved with the use of a mobile phone in the classroom.

7.7 LIMITATIONS AND DELIMITATIONS OF THE STUDY

7.7.1 Limitations in generalizations

The study is not without limitations. It took place at one selected public secondary school in Gauteng (the case); thus, the results may not be generalizable to other public secondary schools in Gauteng or in South Africa. The study did ignore the context of real life and it must be made clear that participants cannot be studied meaningfully by ignoring the social, economic and political structures that continue to affect all aspects of education.

7.7.2 Limitations in respondents

Even though anonymity was assured to all learners, learners' parents and educators, some may have felt uneasy about rating their observation regarding the negative aspects of nomophobia and the quality of teaching and learning. Hence, they may have demonstrated subject effects, which is behaviors that may not reflect the practical situation. This situation may have introduced errors in the results (cf. par. 1.2).

A delimitation of the study was the selection of the participants. All educators and learners were from a single case. It must be noted that educators and learners from different schools may have differing views on the impact of nomophobia on the quality of teaching and learning (cf. par.1.2).

7.8 CONCLUDING REMARKS

Attempts to ban or limit student use of cell phones in schools are likely to be controversial, to say the least. Even so, school officials can prevail and limit the amount of time spent policing mobile phone policies by taking the time to plan carefully. This study revealed that educators and learners are all prone to some extent of nomophobia. The aspect of great concern is that the school at which the research was conducted had a ban on the use of mobile phones in the classroom. This indicates that educators and learners are spending a lot of their time outside school on their mobile phones. This time can be used constructively for improving the quality of teaching and learning. Monitoring the learners smuggling mobile phones in the classroom poses more discipline problems for the school staff. School staff have to police the use of mobile phones in the classroom when the mobile phones are actually banned.

Under the above circumstances and from the research conducted, it is clear that educators and learners alike feel that mobile phones should be used for educational purposes in the classroom. Educators and learners were vocal that mobile phones can be brought into school with certain controls and restrictions. This study further looked at creating a framework for a mobile phone policy for educators and a mobile phone policy for learners that would allow educators and learners to use their mobile phones

in school with some provisions. This framework for a policy will allow educators and learners to have some introspection regarding their personal mobile phone usage.

Moving forward, educators and learners must be given support if indeed they do suffer from severe nomophobia. This support must be provided by the Department of Education as they do with other mental disorders. Controlling the use of mobile phones in general can improve the quality of teaching and learning and create a pleasurable work environment.

In sum, the cumulative evidence of the risks and detrimental impact of mobile phones on learners learning, well-being, and safety suggests that educators must address these devices' presence and roles in schools more seriously and systematically than has been the case to date. While some educators and learners believe that mobile phones can be used to enhance and boost instruction, others fear that the negative effects of their use in class clearly outweigh the potential benefits. Finding the right balance for learner mobile phone use in schools is a daunting challenge calling for a community-wide approach involving learners, parents, educators, school governing bodies, the Department of Education, and broader social awareness about the effects of mobile phones on youth achievement and well-being. Consistency, and follow-through, in expectations is of fundamental importance if learners are to respect rules limiting their freedom and if learners are unlikely to abide by rules that are not consistently enforced. Consensus on the appropriate role of mobile phones in schools is unlikely to emerge in the near future. Even so, creating policies and procedures regulating educator and learner use of mobile phones in schools is an important step in addressing and ameliorating the growing concerns about their misuse in and around schools, their effects on mental health, and maintaining schools as safe and orderly places for teaching and learning in which all learners can succeed.

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ANNEXURES

Annexure A: Questionnaire

UNIVERSITY OF SOUTH AFRICA (UNISA)

QUESTIONNAIRE

Circle the applicable code or fill in the number where applicable. Refer to the example below for choosing male.

Example:

Gender	
Male	(1)
Female	2

SECTION A: PERSONAL INFORMATION

A1: GENDER	
Male	**1**
Female	**2**

A2: DO YOU OWN A MOBILE PHONE	
Yes	**1**
No	**2**

A3: ARE YOU AN EDUCATOR OR LEARNER	
Educator	**1**
Learner	**2**

IF YOUR ANSWER TO A2 IS 'YES' THEN YOU MAY CARRY ON WITH THE QUESTIONNAIRE, OTHERWISE PLEASE HAND THE QUESTIONNAIRE BACK TO THE PERSON WHO GAVE IT TO YOU. YOUR INPUT IS VALUABLE.

TO BE FILLED IN BY EDUCATORS ONLY !	
A4: HIGHEST EDUCATIONAL QUALIFICATION	
Lower than grade 12	**1**
Grade 12	**2**
Diploma	**3**
Degree	**4**
Post graduate Honours Degree	**5**
Post graduate Masters Degree	**6**
Post graduate Doctorate degree	**7**
Other (Specify here):	**8**

TO BE FILLED IN BY LEARNERS ONLY !	
A5: CURRENT GRADE IN SCHOOL	
GRADE 8	**1**
GRADE 9	**2**
GRADE 10	**3**
GRADE 11	**4**
GRADE 12	**5**

A6: AGE		
e.g., forty-five years	**4**	**5**

SECTION B / C / D / E

This section pertains to the perception of your personal mobile phone usage. The questions that follow are NOT a test of your competence. There are no correct or incorrect answers. State your opinion by circling the appropriate number on the scale:

1=strongly agree 2=disagree 3=partially disagree 4=neutral

5=partially agree 6=agree 7=strongly agree

Example: To what extent do you agree or disagree with the following statement: My hands sweat when I don't have my mobile phone with me.

If you only partially agree with this statement, then circle as follows:

Strongly disagree	1	2	3	4	5	6	7	Strongly agree

NOTE: Educators refers to level 1 educators, Departmental Heads, Deputy Principals and Principals.

	No.	To what extent do you agree or disagree with the following statements in relation to your PERCEPTION ON YOUR MOBILE PHONE	Strongly disagree	Disagree	Partially disagree	Neutral	Partially agree	Agree	Strongly agree
NOT BEING ABLE TO ACCESS INFORMATION									
B	1	I would feel uncomfortable without constant access to information through my mobile phone	1	2	3	4	5	6	7
B	2	I would be annoyed if I could not look for information on my mobile phone when I wanted to	1	2	3	4	5	6	7
B	3	Being unable to get the news (e.g., happenings, weather, etc) on my mobile phone would make me nervous	1	2	3	4	5	6	7
B	4	I would be annoyed if I could not use my mobile phone or its capabilities when I wanted to do so	1	2	3	4	5	6	7

GIVING UP CONVENIENCE									
B	**5**	**Running out of battery in my mobile phone would scare me**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**6**	**If I were to run out of credits or hit my monthly data limit, I would panic**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**7**	**If I did not have a data signal or could not connect to WIFI then I would constantly to see if I had a signal or could find a WIFI network**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**8**	**If I could not use my mobile phone, I would be afraid of getting stranded somewhere**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**9**	**If I could not check my mobile phone for a while, I would have a desire to check it**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
NOT BEING ABLE TO COMMUNICATE									
B	**10**	**If I did not have my mobile phone with me, I would feel anxious because I could not instantly communicate with my family/friends**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**11**	**If I did not have my mobile phone with me, I would be worried because my family/friends could not reach me**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**12**	**If I did not have my mobile phone with me, I would feel nervous because I would not be able to receive text messages and calls**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**13**	**If I did not have my mobile phone with me, I would be anxious because I could not keep in touch with family/friends**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**14**	**If I did not have my mobile phone with me, I would be nervous because I could not know if someone had tried to get a hold of me**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	**15**	**If I did not have my mobile phone with me, I would feel anxious because my constant connection with my family/friends would be broken**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

No.		To what extent do you agree or disagree with the following statements in relation to your PERCEPTION ON YOUR MOBILE PHONE	Strongly disagree	Disagree	Partially disagree	Neutral	Partially agree	Agree	Strongly agree
LOSING CONNECTEDNESS									
B	**16**	**If I did not have my mobile phone with me, I would be nervous because I would be disconnected from my online identity**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	17	If I did not have my mobile phone with me, I would be uncomfortable because I could not stay up to date with social media and online networks	1	2	3	4	5	6	7
B	18	If I did not have my mobile phone with me, I would feel awkward because I could not check my notifications for updates from my connections and online networks	1	2	3	4	5	6	7
B	19	If I did not have my mobile phone with me, I would feel anxious because I could not check my email messages	1	2	3	4	5	6	7
B	20	If I did not have my mobile phone with me, I would feel weird because I would not know what to do	1	2	3	4	5	6	7
MOBILE PHONES AND THE QUALITY OF TEACHING									
C	21	Teachers can improve the lesson if they can use their mobile phones in the classroom	1	2	3	4	5	6	7
C	22	Teachers can use websites to explain topics they are not familiar with	1	2	3	4	5	6	7
C	23	I feel teachers would be distracted with a mobile phone in the classroom	1	2	3	4	5	6	7
MOBILE PHONES AND THE QUALITY OF LEARNING									
D	24	If learners are allowed to have mobile phones in the classroom it can improve the quality of learning	1	2	3	4	5	6	7
D	**25**	**If learners have mobile phones in the classroom it will encourage sharing of knowledge**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
D	**26**	**If learners have mobile phones in the classroom extension activities can be given from learning websites**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
MANAGING THE IMPACT OF MOBILE PHONE USE									
E	**28**	**Distractions caused by mobile phones in the classroom can be controlled**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Thank you for your time and kind co-operation

Please hand the completed questionnaire to the person from whom you have received it or email to jmatwadia@gmail.com

Annexure B: Application for permission to conduct research in GDE.

UNIVERSITY OF SOUTH AFRICA (UNISA)

To: Head of Department

APPLICATION FOR PERMISSION TO CONDUCT RESEARCH.

I, Zyliekha Matwadia, am studying for a Doctoral Degree in Education (Education Leadership and Management) with the University of South Africa (UNISA), under the supervision of Prof R J (Nico) Botha, in the College of Education, and wish to conduct an empirical research study entitled: *MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS.*

The history of nomophobia (fear of not having mobile usage) shows that it can impact on the quality of every aspect of human life. Central to my research is determining whether educators and learners do indeed suffer from nomophobia, and if so, how can the impact of nomophobia be managed to improve the quality of teaching and learning. The views and experiences of educators and learners are critical to my research and fundamental to this study.

The objectives of this research are to:

- Define and describe the concept of nomophobia
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent
- Establish the impact or extent of nomophobia on teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

I humbly appeal to you to permit me to conduct my study within your department at the selected school. The study is a mixed methods case study. Educators and learners will be asked to complete a

questionnaire, following which selected educators and learners will be interviewed. Educators and learners may withdraw from the study at anytime. The study will gather data on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. All information (names of participants and school) will not be revealed.

I hope that the findings from this study will be beneficial to the educators and learners, and the school as a whole. My contact details and that of my supervisor are below. Should you require any clarification please do not hesitate to contact me or my supervisor.

Thank you.

Yours sincerely

_____

Z Matwadia (UNISA student number: 54351103, Cell no: 0829216278)

This study is supervised by Professor R J (Nico) Botha, Cell: 0824116361.

Researcher Email: 54351103@mylife.unisa.ac.za

Annexure C: Request permission from principal of school to conduct research.

UNIVERSITY OF SOUTH AFRICA (UNISA)

The Principal,

…… Secondary School

Dear Sir

RE: REQUEST TO CONDUCT RESEARCH IN YOUR SCHOOL

I, Zyliekha Matwadia, am studying for a Doctoral Degree in Education (Education Leadership and Management) with the University of South Africa (UNISA), under the supervision of Prof R J (Nico) Botha, in the College of Education, and wish to conduct an empirical research study entitled: *MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS.*

The history of nomophobia (fear of not having mobile usage) shows that it can impact on the quality of every aspect of human life. Central to my research is determining whether educators and learners do indeed suffer from nomophobia, and if so, how can the impact of nomophobia be managed to improve the quality of teaching and learning. The views and experiences of educators and learners are critical to my research and fundamental to this study.

The objectives of this research are to:

- Define and describe the concept of nomophobia.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the impact or extent of nomophobia on teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

I humbly appeal to you to permit me to conduct my study at your school. The study is a mixed methods case study. Educators and learners will be asked to complete a questionnaire, following which selected educators and learners will be interviewed. Educators and learners may withdraw from the study at anytime. The study will gather data on how to manage the impact of nomophobia on the quality of teaching and learning in Gauteng schools. All information (names of participants and school) will not be revealed.

I hope that the findings from this study will be beneficial to the educators and learners, the school as a whole and the entire education sector. My contact details and that of my supervisor are below. Should you require any clarification please do not hesitate to contact me or my supervisor.

Thank you.

Yours sincerely

_____

Z Matwadia (UNISA student number: 54351103, Cell no: 0829216278)

This study is supervised by Professor R J (Nico) Botha, Cell: 0824116361.

Researcher Email: 54351103@mylife.unisa.ac.za

If you understand the request and agree to permit the study, please sign the consent form below.

……

CONSENT FORM

I…… (Full name of PRINCIPAL) hereby confirm that I have read and understood the contents of this document and the nature of the study; and consent to the study being undertaken in my school.

……. ……..

Signature Date

Annexure D: Request for participation (Phase 1 and 2 – Educator Participant)

UNIVERSITY OF SOUTH AFRICA (UNISA)

Dear Educator Participant

RE: REQUEST FOR YOUR PARTICIPATION

I, Zyliekha Matwadia, am studying for a Doctoral Degree in Education (Education Leadership and Management) with the University of South Africa (UNISA), under the supervision of Prof R J (Nico) Botha, in the College of Education, and wish to conduct an empirical research study entitled: *MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS.*

The history of nomophobia (fear of not having mobile usage) shows that it can impact on the quality of every aspect of human life. Central to my research is determining whether educators and learners do indeed suffer from nomophobia, and if so, how can the impact of nomophobia be managed to improve the quality of teaching and learning. The views and experiences of educators are critical to my research and fundamental to this study.

The objectives of this research are to:

- Define and describe the concept of nomophobia.
- Determine if teachers and learners in Gauteng schools perceive themselves to suffer from nomophobia and if so, to what extent.
- Establish the impact or extent of nomophobia on teaching and learning in Gauteng schools; and
- Discuss how the negative effect or impact of nomophobia on teaching and learning in Gauteng schools can be managed effectively.

You have been identified as an educator to share some of your views and experiences of your personal mobile phone use. You will be requested to participate in a survey and later selected participants will be asked to share their views in an interview.

Note to participants:

- Your identity will not be divulged under any circumstance.
- Participation is voluntary and you may withdraw from the study at any time.
- There are no correct or incorrect answers. Your views on the impact of mobile phone use on the quality of teaching and learning form the foundation of this study.

- All responses will be treated with strict confidentiality.
- You will not be forced to disclose information you do not want revealed.
- Written notes and audio recordings will be done and stored in my personal safe for five years and thereafter incinerated.
- Permission to conduct this study has been obtained from the Gauteng Department of Education (GDE) and ethical clearance has been received from UNISA.

I humbly appeal to you to participate in the study. I hope that the findings from this study will be beneficial to the educators and learners, the school as a whole and the entire education sector. My contact details and that of my supervisor are below. Should you require any clarification please do not hesitate to contact me or my supervisor.

Thank you.

Yours sincerely

_____

Z Matwadia (UNISA student number: 54351103, Cell no: 0829216278)

This study is supervised by Professor R J (Nico) Botha, Cell: 0824116361.

Researcher Email: 54351103@mylife.unisa.ac.za

If you understand the request and agree to participate in the study, please sign the consent form below.

……

DECLARATION FORM

I…… (Full name of Participant) hereby confirm that I have read and understood the contents of this document and the nature of the study; and consent to participate in the study.

……. ……..

Signature Date

Annexure E: Letter requesting parental consent for minors to participate in a research project (Phase 1 and 2).

UNIVERSITY OF SOUTH AFRICA (UNISA)

Dear Parent

RE: REQUESTING PARENTAL CONSENT FOR YOUR CHILD TO PARTICIPATE IN A RESEARCH PROJECT

I, Zyliekha Matwadia, am studying for a Doctoral Degree in Education (Education Leadership and Management) with the University of South Africa (UNISA), under the supervision of Prof R J (Nico) Botha, in the College of Education, and wish to conduct an empirical research study entitled: *MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS.*

The history of nomophobia (fear of not having mobile usage) shows that it can impact on the quality of every aspect of human life. Central to my research is determining whether educators and learners do indeed suffer from nomophobia, and if so, how can the impact of nomophobia be managed to improve the quality of teaching and learning. The views and experiences of educators and learners are critical to my research and fundamental to this study.

Your child has is invited to participate in the study and share some of his/her views and experiences of his/her personal mobile phone use. I am asking permission to include your child in this study because his/her views will be beneficial to the school as a whole and to the education sector. I expect to have other children participating in the study.

If you allow your child to participate, I shall request him/her to:

- Take part in a survey; and
- Perhaps take part in an interview (only selected learners)

Any information that is obtained in connection with this study and can be identified with your child will remain confidential and will only be disclosed with your permission. His/her responses will not be linked to his/her name or your name or the school's name in any written or verbal report based on this study. Such a report will be used for research purposes only.

Note to Parents:

- Your child's identity will not be divulged under any circumstance.
- Participation is voluntary and he/she may withdraw from the study at any time.

- There are no correct or incorrect answers. Your child's views on the impact of mobile phone use on the quality of teaching and learning form the foundation of this study.
- All responses will be treated with strict confidentiality.
- Your child will not be forced to disclose information that he/she does not want revealed.
- Written notes and audio recordings will be done and stored in my personal safe for five years and thereafter incinerated.
- Permission to conduct this study has been obtained from the Gauteng Department of Education (GDE) and ethical clearance has been received from UNISA.

The study will take place during regular classroom activities with the prior approval of the school and your child's teacher. However, if you do not want your child to participate, an alternative activity will be available. In addition to your permission, your child must agree to participate in the study and you and your child will also be asked to sign the assent form which accompanies this letter. If your child does not wish to participate in the study, he or she will not be included and there will be no penalty.

I humbly appeal to you to allow your child to participate in the study. I hope that the findings from this study will be beneficial to the educators and learners, the school as a whole and the entire education sector. My contact details and that of my supervisor are below. Should you require any clarification please do not hesitate to contact me or my supervisor.

Thank you.

Yours sincerely

_____

Z Matwadia (UNISA student number: 54351103, Cell no: 0829216278)

This study is supervised by Professor R J (Nico) Botha, Cell: 0824116361.

Researcher Email: 54351103@mylife.unisa.ac.za

You are making a decision about allowing your child to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. You may keep a copy of this letter.

Name of child:

Sincerely

_____	_____	_____
Parent/guardian's name (print)	Parent/guardian's signature:	Date:
_____	_____	_____
Researcher's name (print)	Researcher's signature	Date:

Annexure F: Letter requesting assent from learners in a secondary school to participate in a research project (Phase1 and Phase 2)

UNIVERSITY OF SOUTH AFRICA (UNISA)

Dear Learner

RE: REQUESTING ASSENT FOR YOU TO PARTICIPATE IN A RESEARCH PROJECT

I, Zyliekha Matwadia, am studying for a Doctoral Degree in Education (Education Leadership and Management) with the University of South Africa (UNISA), under the supervision of Prof R J (Nico) Botha, in the College of Education, and wish to conduct an empirical research study entitled: *MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS.*

The history of nomophobia (fear of not having mobile usage) shows that it can impact on the quality of every aspect of human life. Central to my research is determining whether educators and learners do indeed suffer from nomophobia, and if so, how can the impact of nomophobia be managed to improve the quality of teaching and learning. The views and experiences of educators and learners are critical to my research and fundamental to this study.

Your principal has given me permission to do this study in your school. I would like to invite you to be a very special part of my study by sharing your views and experiences of his/her your personal mobile phone use. I am doing this study so that I can find ways that your teachers can use mobile phones more effectively for teaching. This may help you and many other learners of your age in different schools.

This letter is to explain to you what I would like you to do. There may be some words you do not know in this letter. You may ask me or any other adult to explain any of these words that you do not know or understand. You may take a copy of this letter home to think about my invitation and talk to your parents about this before you decide if you want to be in this study.

If you do participate, I shall request you to:

- Take part in a survey; and
- Perhaps take part in an interview (only selected learners)

I will write a report on the study, but I will not use your name in the report or say anything that will let other people know who you are. Participation is voluntary and you do not have to be part of this study if you don't want to take part. If you choose to be in the study, you may stop taking part at any time without penalty. You may tell me if you do not wish to answer any of my questions. No one will blame or criticise

you. When I am finished with my study, you will be welcome to read through the study to find out about helpful and interesting things I found out in my study.

I hope that the findings from this study will be beneficial to the educators and learners, the school as a whole and the entire education sector.

If you decide to be part of my study, you will be asked to sign the form on the next page. If you have any other questions about this study, you can talk to me or you can have your parent or another adult email me at 54351103@mylife.unisa.ac.za. Do not sign the form until you have all your questions answered and understand what I would like you to do.

Do not sign the written assent form if you have any questions. Ask your questions first and ensure that someone answers those questions.

WRITTEN ASSENT

I have read this letter which asks me to be part of a study at my school. I have understood the information about the study and I know what I will be asked to do. I am willing to be in the study.

_____ _____ _____

Learner's name (print): Learner's signature: Date:

_____ _____ _____

Witness's name (print) Witness's signature Date:

(The witness is over 18 years old and present when signed.)

_____ _____ _____

Parent/guardian's name (print) Parent/guardian's signature: Date:

_____ _____ _____

Researcher's name (print) Researcher's signature: Date:

Z Matwadia (UNISA student number: 54351103, Cell no: 0829216278)

This study is supervised by Professor R J (Nico) Botha, Cell: 0824116361.

Researcher Email: 54351103@mylife.unisa.ac.za

Annexure G: Semi-structured interview schedule (Educators)

UNIVERSITY OF SOUTH AFRICA (UNISA)

1. Tell me about yourself:

1.1 How many years are you in the teaching profession?

1.2 What are your qualifications?

1.3 How old are you?

2. Tell me about your cell phone usage:

2.1 Access to information.

2.1.1 What kind of information do you regularly check up on?

2.1.2 When you don't have access to this information how do you feel?

2.1.3 What kind of movies and you tube videos do you watch? (How often?)

2.1.4 Do you have a favourite game that you play on your mobile phone? (How often?)

2.2 Giving up convenience.

2.2.1 If you run out of data, how long will you take to buy data again?

2.2.2 If your battery life runs out, what do you do?

2.2.3 If you forget your mobile phone at home, and you are at work (or any place else) how do you feel?

2.3 Not being able to communicate.

2.3.1 Do you use your mobile phone to communicate with friends/family/work related?

2.3.2 Do you struggle with FOMO (fear of missing out)?

2.3.3 Do you prefer to send a whatsapp message/email instead of talking to someone one on one?

2.4 Losing connectedness

2.4.1 Are you a keen follower of social media websites? (Which ones?)

2.4.2 How often do you view these sites?

2.5 Quality of teaching

2.5.1 How would you determine an excellent quality of teaching?

2.5.2 Do you think using a mobile phone in the classroom can improve the quality of your teaching?

2.5.3 If you did not have a mobile phone at all, do you think the quality of your lessons would be better?

2.6 Quality of learning

2.6.1 How would you determine the quality of learning is excellent?

2.6.2 Do you think if learners were allowed to use mobile phones in the classroom, the quality of learning would improve? (Substantiate.)

2.6.3 Do you think that mobile phones for learners, whether used at home or in school, have benefits?

2.7 How do you think you can manage the use of your mobile phone so that you can use it to improve lessons?

Annexure H: Semi-structured interview schedule (Learners)

UNIVERSITY OF SOUTH AFRICA (UNISA)

1. Tell me about yourself:

1.1 What grade are you in?

1.3 How old are you?

2. Tell me about your cell phone usage:

2.1 Access to information.

2.1.1 What kind of information do you regularly check up on?

2.1.2 When you don't have access to this information how do you feel?

2.1.3 What kind of movies and you tube videos do you watch? (How often?)

2.1.4 Do you have a favourite game that you play on your mobile phone? (How often?)

2.2 Giving up convenience.

2.2.1 If you run out of data, how long will you take to buy data again?

2.2.2 If your battery life runs out, what do you do?

2.2.3 When your mobile phone is at home, and you are at school (or any place else) how do you feel?

2.3 Not being able to communicate.

2.3.1 Do you use your mobile phone to communicate with friends/family/work related?

2.3.2 Do you struggle with FOMO (fear of missing out)?

2.3.3 Do you prefer to send a whatsapp message/email instead of talking to someone one on one?

2.4 Losing connectedness

2.4.1 Are you a keen follower of social media websites? (Which ones?)

2.4.2 How often do you view these sites?

2.5 Quality of teaching

2.5.1 How would you determine an excellent quality of teaching?

2.5.2 Do you think if your teacher uses a mobile phone in the classroom for teaching, the lesson can be improved?

2.5.3 Do you feel teachers are distracted by their mobile phones?

2.6 Quality of learning

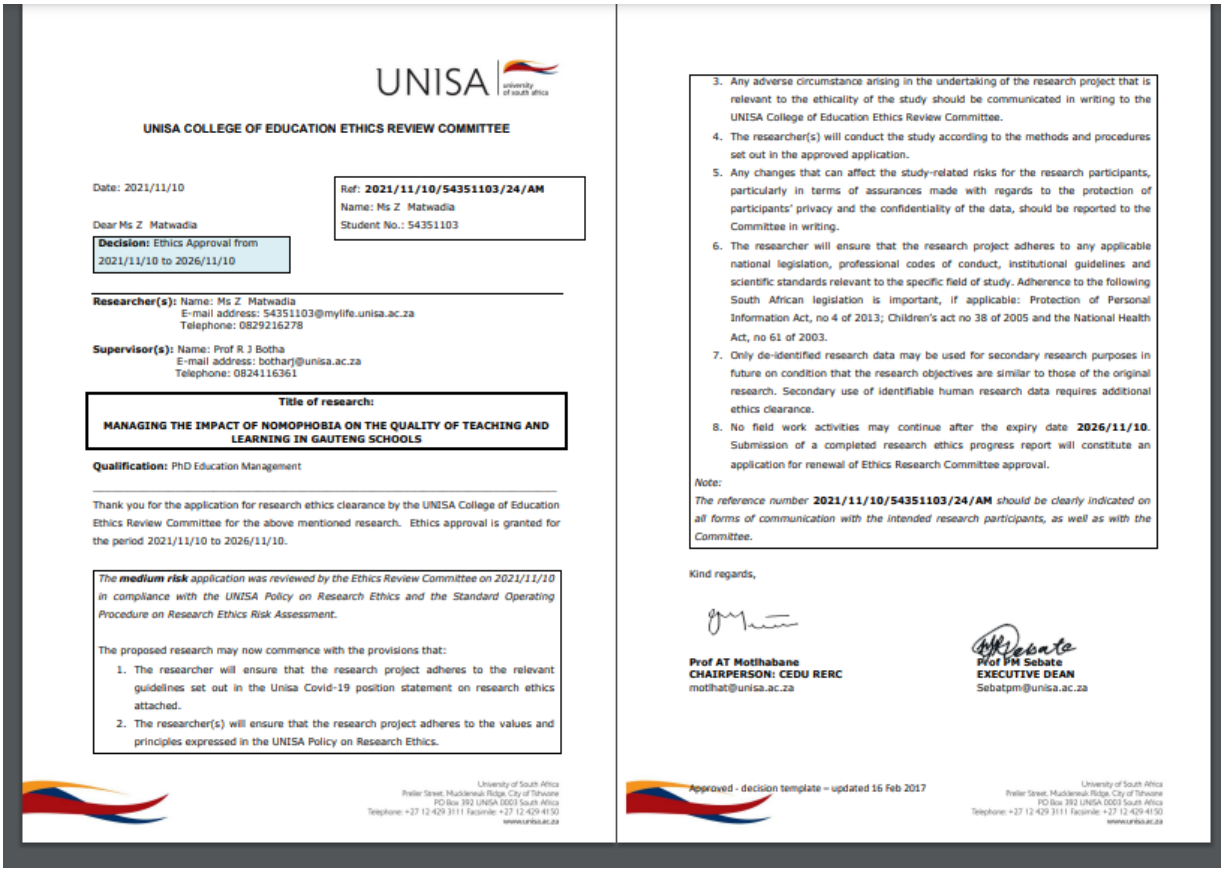
2.6.1 How would you determine the quality of learning is excellent?

2.6.2 Do you think if learners were allowed to use mobile phones in the classroom, the quality of learning would improve? (Substantiate.)

2.6.3 Do you think that mobile phones for learners, whether used at home or in school, have benefits?

2.7 How do you think you can manage the use of your mobile phone so that you can use it to improve the quality of your education?

Annexure I: Ethical clearance certificate from UNISA



UNISA

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2021/11/10

Ref: **2021/11/10/54351103/24/AM**
Name: Ms Z Matwadia
Student No.: 54351103

Dear Ms Z Matwadia

Decision: Ethics Approval from 2021/11/10 to 2026/11/10

Researcher(s): Name: Ms Z Matwadia
E-mail address: 54351103@mylife.unisa.ac.za
Telephone: 0829216278

Supervisor(s): Name: Prof R J Botha
E-mail address: botharj@unisa.ac.za
Telephone: 0824116361

Title of research:

MANAGING THE IMPACT OF NOMOPHOBIA ON THE QUALITY OF TEACHING AND LEARNING IN GAUTENG SCHOOLS

Qualification: PhD Education Management

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2021/11/10 to 2026/11/10.

*The **medium risk** application was reviewed by the Ethics Review Committee on 2021/11/10 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2026/11/10**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:
*The reference number **2021/11/10/54351103/24/AM** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za

Prof PM Sebate
EXECUTIVE DEAN
Sebatpm@unisa.ac.za

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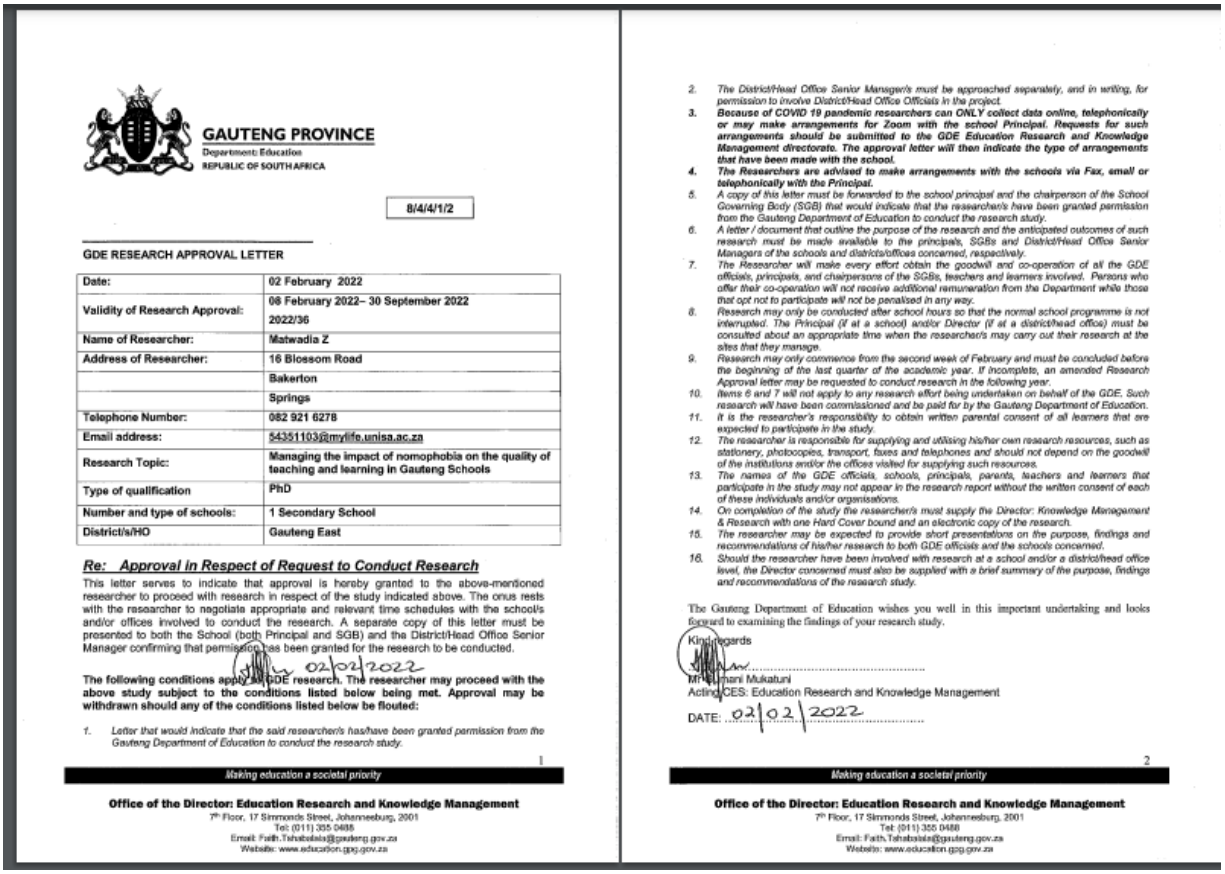
Annexure J: GDE Research Approval



GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**02 February 2022**
Validity of Research Approval:	**08 February 2022– 30 September 2022** **2022/36**
Name of Researcher:	**Matwadia Z**
Address of Researcher:	**16 Blossom Road**
	Bakerton
	Springs
Telephone Number:	**082 921 6278**
Email address:	**54351103@mylife.unisa.ac.za**
Research Topic:	**Managing the impact of nomophobia on the quality of teaching and learning in Gauteng Schools**
Type of qualification	**PhD**
Number and type of schools:	**1 Secondary School**
District/s/HO	**Gauteng 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 to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

02/02/2022

The following conditions apply to GDE research. The researcher 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:

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. ***Because of COVID 19 pandemic researchers can ONLY collect data online, telephonically or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate. The approval letter will then indicate the type of arrangements that have been made with the school.***
4. ***The Researchers are advised to make arrangements with the schools via Fax, email or telephonically with the Principal.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principal/s, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE official/s, principal/s, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *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.*
10. *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.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *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.*
13. *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.*
14. *On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *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.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director 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

.....

Mr Thulani Mukaturi
Acting CES: Education Research and Knowledge Management

DATE: 02/02/2022

1

Making education a societal priority

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

2

Making education a societal priority

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Annexure K: Learner 01 Interview Schedule

Interviewer: Tell me about yourself?
Interviewee: I am 13 years old; I really enjoy modeling and my favorite subject in school is math.
Interviewer: Tell me something about your cell phone usage, say for example do you like to access information about your cell phone?
Interviewee: Yes
Interviewer: What kind of information do you regularly check up on daily, what kind of apps?
Interviewee: I go to news report and check on news update, and maybe go on Instagram so see any new posts.
Interviewer: If you don't have access to this information, how do you feel?
Interviewee: It really hurt because I really want to know what is happening
Interviewer: Ok do you watch any YouTube videos or movies?
Interviewee: Yes madam
Interviewer: A lot?
Interviewee: Not really because of school
Interviewer: Ok how often would you say you use YouTube?
Interviewee: Only weekends
Interviewer: Do you use YouTube for school?
Interviewee: Yes, some time to get tutoring videos
Interviewer: Ok for example if the is something in math that you don't understand, you will download a video and watch it?
Interviewee: Yes
Interviewer: Do they help?
Interviewee: Yes, they show us a lot of different examples or ways of getting the answers
Interviewer: Do you play any games on your phone?
Interviewee: Yes
Interviewer: What's your favorite game?
Interviewee: Somewhere safer
Interviewee: How many hours do you spend on it?
Interviewer: Maybe about 2 to 3 hours per day?
Interviewee: Do you think you addicted to the game?
Interviewer: Yes
Interviewee: If you were to remove that game and do something else, would it be easy to remove that game from you?
Interviewer: No because I'll be constantly thinking about going to the next level
Interviewee: That game that you play, does it interfere with your schoolwork?
Interviewer: Not really because I first do my schoolwork then take my phone
Interviewee: Does the game run on data?
Interviewer: No, it doesn't
Interviewee: If you do run out of data, how do you feel?
Interviewer: I really hurts because sometimes you will not get any updates or WhatsApp messages.
Interviewee: Do you have WIFI at home, unlimited?
Interviewer: Yes
Interviewee: But you do also buy data?
Interviewer: Yes, my father buys for me
Interviewee: If your data runs out, how long do you have to wait till you father buys data again?

Interviewer: Maybe like 2 or 3 weeks
Interviewee: So, he doesn't buy it immediately for you?
Interviewer: Sometimes when I ask him, but I don't ask him often
Interviewee: So, if you do buy data, how often do you buy data?
Interviewer: Once a month
Interviewee: How many gigs do you buy?
Interviewer: Normally its one gig but sometimes its two
Interviewee: If your battery life run out, how do you feel?
Interviewer: I'll be on panic mode because I really need to check on my phone
Interviewee: So, you make sure your battery is always full?
Interviewer: Yes
Interviewee: When your mobile phone is at home and you are here in school or any other place, how do you feel?
Interviewer: Sometimes it's difficult because I was to message my friend and check up on them
Interviewee: Do you sometimes sneak your phone to school, or you leave it at home?
Interviewer: No madam, my parents take my phone at night
Interviewee: Have you accepted that you not allowed your phone at school and you not going to have it here?
Interviewer: Yes
Interviewee: If you could bring it to school, you would be happy to bring it to school?
Interviewer: Yes
Interviewee: And your parents, they will be happy if you bring it to school?
Interviewer: Yes, but only if I give it in to the office.
Interviewer: Do you use your phone to communicate with family and friends?
Interviewee: Yes, every day
Interviewer: More like extended family or immediate family?
Interviewee: More like extended family and close friends
Interviewer: if you not on this WhatsApp groups, would you suffer from FOMO, do you know what is FOMO (fear of missing out)?
Interviewee: No because I am not allowed to be on any WhatsApp groups
Interviewer: Does your teachers have WhatsApp groups?
Interviewee: No, we only have one RCL group
Interviewer: Does your parents check what you do on your phone?
Interviewee: Yes, my mother checks my phone daily
Interviewer: Instead of talking to you one on one, rather than on Facebook or WhatsApp. Would you be comfortable talking to me like this?
Interviewee: I prefer person to person because WhatsApp sometimes I don't check my messages
Interviewer: Are you a keen follower of social media websites?
Interviewee: No not really
Interviewer: But you do like Instagram, how many people do you follow?
Interviewee: about 70
Interviewer: How many follow you?
Interviewee: I think it's about 61
Interviewee: What makes you think that you got an excellent quality of teaching, at this school?
Interviewer: Because the teachers are always disciplined, and they make sure everything is in order. Nothing is out of order.
Interviewee: So, for you that determines good quality of teaching?
Interviewer: Yes

Interviewee: If teachers are allowed to use mobile phones for teaching do you think the lesson can be improved?
Interviewer: Yes, it would but there would also be some distractions
Interviewee: Do you think teachers themselves will be distracted by their phones, or do you think they will stay on task?
Interviewer: I think they will stay on task
Interviewee: in terms of quality of learning, how would you view quality of learning?
Interviewer: it depends on the learner if the learner if focused then quality will be good. But if the learner is distracted and not focused enough then the quality is going to be bad.
Interviewer: If learners were allowed to use mobile phones in the classroom do you think quality of learning will improve?
Interviewee: It will also be a distraction because learner would rather be on their phone instead of doing the teachers work
Interviewer: Do you think we can control these kinds of distractions?
Interviewee: I think we can all put our phones on silent or switch it off while learning
Interviewer: What if we want to use it for learning?
Interviewee: I think it would be useful, to download videos on YouTube, we can learn little bit more.
Interviewer: How do you think we can use our mobile phone to improve quality of your education?
Interviewee: I think that if we can use our phone at a certain time but after break, we can't use our phones at all
Interviewer: Thank you for you so much for you time.