Anxiety associated with the use of technology among teachers in Lesotho

by

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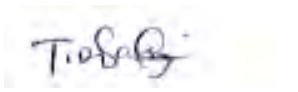
DECLARATION

I, **TLABA DAVID TLABA** (Student Number **200812639**), declare that this mini-dissertation, which is submitted in partial fulfilment of the requirements of the degree of Master of Education to the University of Zululand, is my own work in design and execution, and has not been previously submitted by me for a degree at any university, and that all sources I have used have been indicated and acknowledged by means of a complete reference.



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Tlaba David Tlaba **October 2016**

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Finally, unto Him who intervenes in the history of mankind by means of His revelation.

DEDICATION

This study is dedicated to my late supervisor Prof. P.T. Sibaya, and my family for their continued support and encouragement.

ABSTRACT

The purpose of this study is to investigate anxiety associated with the use of technology among teachers in Lesotho. The sample consists of 100 high school teachers from various schools located in the Maseru district. To meet the objectives, a questionnaire was designed, which collected data on teachers' anxieties towards technology in relation to demographic variables.

The findings of the study suggest that the educators do differ in their anxiety levels in relation to technology, and that there is no correlation between age and anxiety. The relationship between the variable of gender and anxiety is revealed. Furthermore, teaching experience is found to have a significant effect on anxiety, while nationality is found to have no effect on anxiety.

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CHAPTER ONE

ORIENTATION

1.1 Introduction

Information and Communication Technologies (ICTs) have emerged as one of the most important features of daily human life. Being referred to as a new channel, a renewed way of presenting, and transmitting ideas, and working with information, uses of ICT have redefined modern life and its organisation (Kukreti & Saxena, 2014). As the access to information continues to improve quickly, schools cannot remain as just places for disseminating a fixed set of information, dictated by a teacher to students over an advised length of time. Rather, schools are obligated to promote skills acquisition and knowledge retention (Chaudhary & Sharma, 2014).

ICT commenced with the work of Charles Babbage in 1822 with his plan for a so-called 'Difference Engine' – the very first computer. However, the introduction of computing came to the fore during and after World War II, and is observed as, "the set of activities that facilitates the processing, transmitting and display of information by electronic means" (Roblyer, 2014, p.6). With the initiation of the internet and World Wide Web (www), the use of ICT has become universal.

The challenge developing countries face is how to become a learning society and ensure that their citizens are equipped with skills, knowledge and qualifications in ICTs. Ali (2010) extolled that the ICT revolution brings particular challenges to education systems around the globe. These challenges encompass three broad areas. The first has to do with the participation of society; the second is the ICT influence on access,

cost-effectiveness and quality of education, while the third is to do with the way ICT challenges the education process. Additionally, another challenge faces developing countries. Lesotho, being amongst them, is preparing itself to partake in the globalisation process, as well as in the communication and information revolution. The appearance of this new universal economy has serious significances for the nature and intention of educational institutions.

1.2 Literature review

Educational technology and computers execute a significant role in education. It is, therefore, vital for all students and teachers to utilise and comprehend and implement technology in order to be worthwhile in their professions (Rizza, 2013). Despite the fact that an expanding number of teachers are utilising ICTs at schools, not all of them feel comfortable using with ICT tools. In other words, as Felix (2011) stated, “all of the teachers are not likely to be heavy ICT tools users”. Adebayo (2014) confirmed that ICT alters the process of teaching and learning at schools by the way of its capacity of becoming a foundation of knowledge, a channel of conveying content, and a medium of communication.

Furthermore, Farrell (2013) argued that the embracing of ICT into the practice of education is not something that commenced with the semblance of the recent digital technologies, but technologies like telephone, television and radio were established over 50 years ago and they are still being used to date. Indeed, the so called old ICTs never vanished. What seems new are the numerous methods in which they can be integrated and merged with the modern technologies. However, Pelgrum and Law (2014) quantified that there was not much cautious attention bestowed to these older technological tools and their influences in education until reasonably cheap microcomputers became attainable in the early 1980s.

Pelgrum and Law (2014) stated that the use of technologies in education improved and intensified universally during the introduction of ICT in the early 1990s when electronic mail (e-mail) commenced to become accessible to the public after the emergence of the internet and World Wide Web (www). By then ICT was imagined as an enabler for key education restructurings in many countries, and initiatives were carried out to advance education.

The successful application of ICTs depends to a large extent on how teachers view the use of these new technologies. Teachers with explicitly positive attitudes towards technology, who utilise it in organising their work from a professional standpoint, and in an efficient manner, are more likely to utilize ICT tools successfully to help students and to influence them, in turn, towards a positive attitude to technology (Erixon, 2014). Previous studies emphasise that when utilised suitably, different ICTs are said to assist in broadening access to a degree of educational excellence. Furthermore, ICTs cannot make distinction without skilled and committed teachers; hence ICTs have been used to enhance the quality of teacher training (Chaudhary & Sharma, 2014).

Another consequential facet that ICTs bring about to enhance learning is electronic learning (e-learning). Teachers acquire advantages from ICT tools, and it is significant that they have an enthusiastic sense of its potential use. Also, benefits of e-learning attested by Felix (2011) include time flexibility, a richness of information, and fortification of learning, enriched confidentiality, and the skill to repeat rehearsals time and again, while obtaining computer literacy. Teachers who are proficient and calm with ICTs will help students to be ready for further education, and as well as careers that embrace the use of technology.

Rosen and Maguire (1990) postulated that the technology related resistance and phobias of teachers would have negative effects of not only gaining the advantages

from the ICTs, but also the requirement of transmitting technological proficiency to their students. Haward and Smith (2013) discovered that the deficiency of education, about new technologies, could bring about operational phobias about utilising ICTs. Moreover, their study found that the more teachers equip themselves with technological education decrease the rate of computer phobia and encourage a feeling of competence. Furthermore, spending more time around new technologies increase people's capabilities and reduces the fear of computers. However, Bradley and Russell (1997) argued that the time consumed working with computers should be moderate, or it would present a contradictory outcome. In their previous study, Chua, Chen, and Wong (1999) divulged that anxiety can be consequentially lessened by exposing teachers to new technologies. However, much of it relies on the kind of exposure. These researchers theorise that studies should not concentrate only on the exposure of computers, but also on the kind and the nature of training teachers are offered.

1.3 Statement of the problem

The21st century is also referred to as Information Age or digital era. It is, therefore, an era of information scrutiny and information outburst. However, it is still not difficult to find people with an irrational fear of Information and Communication Technologies (ICTs) and such a phobia is dangerous. There are teachers who view computers as a blockade to education or who see it as an intimidating intruder into their lives (Rosen, Sears,& Weil, 2010). This study, therefore, attempts to solve the problem of technological phobia amongst teachers in Lesotho.

1.3.1Research questions

More precisely, this study endeavours to answer the following research questions:

1.3.1.1 What causes anxiety of ICTs amongst teachers?

1.3.1.1.1 Is there any relationship between the use of technology and anxiety?

1.3.1.1.2 Is anxiety associated with availability and non-availability of technology?

1.3.2 Aims of the study

The aims of this study are:

1.3.2.1 To determine the causes of fear of technology among teachers.

1.3.2.2 To establish a relationship, if any, between the use of technology and anxiety.

1.3.2.3 To find out whether anxiety is associated with availability or non-availability of technology.

1.3.3 Hypotheses

The hypotheses are as follows:

1.3.3.1 There will be a relationship between the type of technology and anxiety.

1.3.3.2 There will be a relationship between the use of technology and anxiety.

1.3.3.3 There will be a relationship between anxiety and exposure to technology.

1.4 Operational definition of terms

1.4.1 Information and Communication Technology (ICT)

In this study, ICT is used as a generic term referring to technologies, which are being used for collecting, storing, editing and passing on information in various forms.

1.4.2 Anxiety

In this study, anxiety means the concerns, fears and attitudes obstructing the use of new technologies and the negative reactions against their use. Anxiety and computer phobia will be used interchangeably.

1.4.3 Information Technology (IT)

In the study, Information Technology (IT) means the study or use of electronic equipment. The words Technology and ICT will be used interchangeably.

1.5 Intended contribution to the body of knowledge

Literature is replete with discussions about ICTs, but there is nothing substantial written about the fear towards new technologies. Most studies are focused on ICT and its advantages but do not address the issue of anxiety amongst teachers. The present study is the first academic study of its kind in Lesotho to reveal the causes of anxiety about technology and provide possible solutions.

This study makes a huge contribution to teachers as it examines the type and quality of training they are provided. This enhances teacher training. There is no doubt that ICTs are also transformational tools which, when used properly, can promote the shift to a learner-centred environment.

The information garnered through this study will be disseminated in the form of a dissertation, articles for scientific journal publication and presentations to conferences.

1.6Research methodology

1.6.1 Research design

This study takes the form of field study. Reviewed literature (Kruger & Mitchell, 2005) reveal that field study is utilised to understand the current status or events. The design involves studying participants in their natural setting. This description is synonymous with field experiment, descriptive design and quasi experimental design.

1.6.2 Sampling design

This study follows probability sampling based on simple random sampling. Neuman (2006) acknowledged that in simple random sampling, each sampling element in the population will have an equal probability of being selected.

The sample is composed of teachers from high schools in Maseru district (the capital town of Lesotho). The researcher chose a sample from both urban and rural settings. Schools were allocated numbers. These numbers were written on a piece of paper. These pieces of paper were folded and placed in a container. The contents were then shuffled, and the researcher took out the pieces of paper one by one, and recorded the number of the school. This process continued until the researcher obtained the designated number of schools. Within each school, sampling of teachers were purposeful.

1.6.3 Research instrument

1.6.3.1 Its nature

In this study, the researcher used a standardised anxiety scale. This scale was divided into two sections. The first section requires the participants to provide personal information. The second section employs Likert-type scale questions where participants were asked their feelings, and degrees of agreement and disagreement to the given

statements about ICTs. An adopted anxiety scale from Rosen and Weil (1998) was used. This tool brings out information about respondents' feeling of proficiency and fear with respect to new technologies usage.

1.6.3.2 Scoring

The tool comprises of 5-point Likert scale. The responses to the positive-worded items are scored from 5 = strongly agree, 4 = agree, 3 = unsure, 2 = disagree and 1 = strongly disagree. The negative-worded items are scored from 5 = strongly disagree, 4 = disagree, 3 = unsure, 2 = agree, 1 = strongly agree. The data that were generated conform to the appropriate level of measurement.

1.6.3.3 Data analysis

Quantitative methods were utilised for data collection and data analysis SPSS was used.

1.6.4 Description of procedures

A letter to request permission to conduct a study in Lesotho high schools was written, expressing precisely the intention of the study and its benefits to the country, students, teachers and the community at large. A consent letter was given to the respondents. Respondents were informed that their participation in this study was voluntary and they could decline to partake at any time. It was also revealed to participants that all information obtained during the course of this study would be treated strictly confidential. Data that may be reported in the research report, or any journal, would not include any information that could identify participants.

After obtaining permission from the Lesotho Education Department, as well as from pertinent principals, the researcher visited Lesotho schools with a view to collect data. Questionnaires were distributed to the participants and the confounding variables were controlled during the administration process.

1.7Ethical considerations

The researcher is aware of ethical considerations in research and publications and hence complied with them. There are numerous ethical principles, and the researcher cited those applicable to the present study.

- **Compliance with law and standards:** to adhere to this ethical principle, the researcher planned and conducted research in a manner consistent with the law, and internationally and nationally acceptable standards governing research with human participants and animal subjects.
- **Institutional written approval:** to comply with this ethical code, the researcher sought approval from the Institution Research Board for the proposal.
- **Research responsibilities:** to adhere to this ethical principle, the researcher entered into an agreement with participants that clarified the nature of the research and responsibilities of each party.
- **Informed consent to research:** to comply with this ethical code, the researcher included an informed consent, including the purpose of the research, expected duration of the participants' participation, and procedures used in the research. The researcher informed participants that they had a right to decline to participate or withdraw participation at any time, and they were told of the consequences of withdrawal.
- **Reporting research results:** to adhere to this ethical principle, the researcher reported data accurately and corrected errors where they were discovered, as it is unethical to fabricate data or falsify results.
- **Plagiarism:** to comply with this ethical code, the researcher read the university's policy and procedures on research ethics, and its policy and procedures on managing and preventing acts on plagiarism, and appreciates their content; therefore, the researcher properly cited others' ideas and work when reporting research.

- **Duplication of data published:** to adhere to this ethical principle, the researcher shall not publish previously published data again.
- **Sharing data:** to comply with this ethical code, the researcher shall share data with other researchers to allow verification of results.

1.8 Intellectual property and innovation

Besides the usual copyright issues, the rights shall stay with the researcher for the next two years, thereafter they remain with the University. The researcher does not anticipate any unusual intellectual property rights to emanate from this study.

1.9The plan of study

This study will be divided into the following chapters:

Chapter 1: Orientation

This chapter consists of the literature review, statement of the problem, and aims of the study, together with the strategy for setting up the whole scientific report.

Chapter 2: Literature review

This chapter provides a theoretical background to the study. This background considers and discusses the review of related work done previously in this field.

Chapter 3: Research methodology and design

This chapter details the research design and methodology of the study. The design and method of investigation was discussed in detail. The chapter also describes how data was collected and analysed.

Chapter 4: Analysis and Interpretation of data

This chapter is concerned with the analysis and interpretation of the data.

Chapter 5: Conclusion and Recommendations

This chapter presents the main findings of the study, and concludes the research report by making summary, recommendations and discussing limitations of the study.

1.10: Chapter summary

The chapter outlined the foundation for the study by drawing attention to the research problems that are examined, the aims and objectives of the study, and the research methodology that is used to present the findings, conclusions and recommendations in the study. The subsequent chapter deals with review of previous work done in this field.

CHAPTER TWO

REVIEW OF PREVIOUS WORK DONE IN THIS FIELD

2.1 Introduction

Education influences every facet of our lives. Education is a process by which the people acquire proficiency and knowledge. Therefore, the expansion of knowledge becomes decisive in this progression. This process has to welcome every technology that influences knowledge. Literature supports that Information Technologies and computers operate as important tools for teaching and learning processes (Kocasarac, 2014). The objective of contemporary education is to teach people who can then obtain lifelong learning, learn and utilise information. Demirdas (2014) revealed that benefiting from the information technologies in our schools, using computers and the internet for educational intentions, is indispensable in terms of reforming the quality of education. Further, information technologies have influenced education systems by enhancing curricular and instructional approaches (Saracaloglu, Serin, Bulut,& Serin, 2014).

Information and Communication Technology (ICT) has shaped the basis for comprehensive educational transformation around the globe before and since the inception of the new millennium (Selwyn, 2012). Prior to this, just like amongst developing countries, the manner of teaching in Lesotho schools was paper-based.

Lesotho indeed came late into the adoption of ICTs. Computers were introduced into the Lesotho education system in the early 1990s. This chapter presents the review of related literature. The literature will be examined in relation to the aims of the study.

2.2 Studies on the causes of fear of technology among teachers

Computer and communication technologies directly influence various fields like social communication and education. In this context, teachers who are the most important communicators of education should be able to utilise computer and communication technologies actively during teaching-learning process. Educational technology plays a significant role in education. Since the use of technology is no longer restricted to computer science majors, it is important for all students and future teachers to utilise and understand computers and implement technology in order to be successful in their future careers (Rizza, 2013). Literature reveals that when modern technology is introduced, it often produces fear, frustration and anxiety for the people who are mandatory to utilise it. Many people are at a loss on how to manage the strangeness of what has been presented to them for the first time. The result is that people lose confidence, and they become uncomfortable and frustrated, and that leaves them feeling lost and embittered. There is often an expansion in animosity and a lack of confidence in an office when new technology is initiated. Stress rates in people can increase dramatically. Good personnel can become so baffled that they may resign from their employment, depending on whether administration treats the situation sensitively or insensitively (Saracaloglu, Serin, Bulut,& Serin, 2014). Similarly, the introduction of technology in teaching can cause fear among teachers if they lack confidence, and especially when coming in contact with technology for the first time without proper training, (Kling, 2013).

Numerous studies have also explored that self-reported computer fear is a difficult situation for a considerable numbers of teachers (Mcilroy, Sadler,& Boojawon, 2015). Chua, Chen, and Wong (2011) added that the appearance of fear has been tenacious and widespread. Moreover, computer anxiety may impair the quality of student learning as it has been associated with the slower learning of simple tasks. One study even

found this to be independent of any prior level of computer experience (Mahar, Henderson, & Deane, 2011).

A study conducted by Rizza (2013) on assessing pre-service teachers, upholds that teaching and learning activities have a huge impact on educational technology. The author further asserted that the way teachers view technology, how they respond to it, how they present it, and how it helps to accomplish their vision of teaching and learning, will affect the future implementation of educational technology.

Technology is recognised globally as the foundation for national survival and development in a rapidly changing global environment. ICT is central to any economy, and to the quality of life of people in any society. There is no doubt that ICT drives many of today's innovations, and will still likely be very relevant in the coming decades. It is, therefore, dangerous for people to have negative attitudes towards technology.

Reviewed literature indicates that computers can be supportive in reducing anxiety during classroom instructions. Likewise, in a technology-based classroom, it should be noted that a student's inexperience with technology can also cause computer anxiety (Scarpello, 2015).

2.2.1 Lack of teacher confidence and computer anxiety

Literature indicates that anxiety encapsulates many emotions like sorrow, fear, a feeling of failure and weakness, and also not knowing the result, and judgement (Cuceloglu, 2010). Computer anxiety may manifest as physiological symptoms such as increasing blood pressure, speeding heart beat and perspiring of hands. A person's negative feelings about using computers are also stated as temporary emotional feelings like a disorder of attention (Matsumura, 2012). Various teachers do not consider themselves

to be well skilled in using information technologies. They feel anxious about using it in front of a class of students who perhaps know more than they do. Lamer and Timberlake (2011) discovered that teachers were concerned about not showing their students that they did not know how to utilise technological equipment. Furthermore, this study revealed that teachers who experienced this kind of anxiety, were less eager to make use of ICT in their teaching. Consequently, students' attitudes and anticipations of their teachers' proficiency in computers are likely to contribute to teachers' anxiety. Guha (2011) stated that students, who generally have a daily involvement with a wide range of information technologies, are gradually placing demands on teachers, anticipating them to be well-informed in the field of ICT usage.

Literature reveals that the lack of teachers' self-confidence is recognised as a barrier, particularly with regards to the fear of acknowledging to their students that they have limited knowledge in the field of information technology (Ertmer, 2011). This concept of teachers experiencing a fear of technology is also supported by Russell and Bradley (2010). These researchers refer to a 'cyberphobia' that exists in some teachers, which can be an honest concern which deserves serious attention. In a separate study, Bradley and Russell (2012) illustrated that the most common reasons of this computer anxiety were "getting stuck and not knowing what to do next", and "not understanding the computer jargon and the messages it gives". It is postulated by these authors that any approach to diminish computer anxiety in teachers should address these concerns.

Fabry and Higgs (2013) also asserted that teachers' fear of computers arises from a fear of losing their professional rank, as they see the expanding use of computers in teaching as downgrading their traditional educational skills.

Literature investigating the effects of demographic factors on anxiety among teachers Lavasani(2013) revealed that when teachers seek for relevant information through the

internet they may experience tension, in case of lacking relevant expertise and this may be partly due to environmental factors.

The internet is a network of computers. It is the world's largest computer network today. This is nothing but a group of computers linked together so that they can share information and resources. Actually, the internet is not a single computer network, but rather a network of networks (Begum & Kumar, 2015). Sterling (2009) indicated that the internet has been especially popular since the 1990s. The dominant and sophisticated access that it provides to locate data and facilitate personal communication has improved the quality of scientific research. He further advocated that there are four functions of the internet, namely mail, discussion groups, long distance computing and file transfers.

Lavasani (2013) emphasised that when using the internet, teachers need to have a suitable knowledge of information seeking, otherwise, they will experience negative feelings such as fear. The internet is an example of an instrument that provides information to teachers and students. It empowers them to connect with one another. In this setting, vigorous learning and human-computer interactivity can transpire as teachers and students embark on independent research, utilising Web 2.0 (Ebner, 2011). This process leads to the discovery of new information, the investigation of different issues and the resolution of problems. While teachers come across many irrelevant sources of information, they experience anxiety, and if the anxiety caused is because of the unfamiliarity of working with computers is added, the anxiety will be doubled (Lavasani, 2013).

Despite these many advantages, Thatcher, Loughry, Lim, and McKnight (2013) pointed out that some teachers suffer from "internet anxiety", and they define it as a feeling that is stimulated by the use of web technologies; the fear or anxiety that one experiences

while using the internet. Researchers have discovered that computer anxiety is the identifier of internet anxiety (Thatcher et al., 2013), and there is a positive relation between computer proficiency and internet proficiency (Schumacher & Martin, 2012). Also, teachers who have higher self-proficiency and internet proficiency, and lower computer anxiety have more positive attitudes towards using technology (Durndella & Haag, 2014).

The study entitled “The relationship between internet identification, internet anxiety and internet use” showed the majority of respondents were not anxious about using the internet, although there were approximately 8% who showed evidence of internet anxiety. There was, however, a significant relationship between internet anxiety and internet identification. Finally, males had significantly higher internet identification score than females (Jointer, Brosnan, Crook, Durndell, Maras, Miller, Scott,& Lovatt, 2012).

Thatcher et al. (2013) argued that having acquired some skillson technologies allows internet users to decrease their anxiety levels. Other studies by Joiner, Brosnan, Duffield, Gavin, and Maras (2014), and Chou (2012), presented that there is a meaningful and negative relation between weekly internet or computer use, and internet period. Findings of these researchers support each other. In their investigations made on computer anxiety, it has been discovered that while computer use experience has been increasing, the anxiety level has been decreasing. Studies by Chua, Chen, and Wong (2012), and Liu and Lohnson (2013), discovered a negative relation between computer experience and computer anxiety.

Prensky (2013) outlined that, in these numerous new technologies, teachers are unfamiliar with this new environment and are referred to as the “migrants” while students are the “natives”. Many children are introduced to computers at an early age as they utilise them from pre-school days. Teachers, in contrast, have to learn and

reconsider ideas and workflow at a far older age. On the other hand, Chan and Fang (2012) believed that, when assisted by new media collaborations, animations and simulations, teachers will be able to enhance old-style learning material so that education will improve even further.

In this regard, it is very important for teachers and students to benefit from computers and the internet in both the learning and teaching process since computers and the internet allow people to get information, share information and allow distance learning opportunities.

2.2.2 Technical problems

The causes of fear of ICT use, caused by technical problems, can be broadly split into two main areas, namely fear of things going wrong, and lack of technical support. According to Fabry and Higgs (2013), a genuine concern for teachers when considering making use of ICT is the fear of technological equipment breaking down during lesson presentation. Another source of fear is the possibility of something going terribly wrong. In fact, there are strong links between the barrier caused by a fear of doing damage to equipment, and the barrier caused by a lack of teacher confidence. This is highlighted by Bradley and Russell (2010), who noted that a primary source of computer anxiety is the concern teachers have about damaging a computer's hardware or information base. This anxiety is therefore likely to prevent such teachers from attempting to use the technology at all, even before there is a chance for any potential technical problems to occur. Cuban, Cuban, and Kirkpatrick (2011) explained that if technical glitches occur weekly, or even a few times a month, then confidence in the technology's worth erodes, and this has a negative impact on the rate of teachers' use of ICT.

If there is a lack of technical support available in a school, then it is likely that preventative technical maintenance will not be carried out regularly. This condition leads

to a higher risk of technical breakdowns. Cuban (2013) supported this by pointing out that in the schools that cannot afford technicians, there are often, “software glitches and servers crash, torpedoing lessons again and again”. Once breakdowns occur, a lack of technical support may mean that the equipment remains out of use for a longer period of time. An example of this is highlighted in Butter and Sellbom’s (2010) case study, where a burnt-out projector bulb took three weeks to be replaced. The fact that teachers may be anxious towards technical things, means that the consequences of the bulb not being replaced would hinder the normal running of the lessons.

Preston and Cox (2015) provided evidence of the fact that the breakdown of equipment inhibits the use of ICT in schools. The authors reported on comments made about technical problems resulting in the “demotivation of students”, and the removal of “time or resources from other important curriculum areas”.

2.3 Studies on relationship between qualification and anxiety

A study conducted on the anxiety levels of teachers from a social sciences and linguistics perspective has shown that anxiety levels vary according to the qualifications that teachers coming from different academic areas hold. It is seen that anxiety levels are influenced by academic specialism (Bardakci, Alarkurt, & Samsa, 2013). In terms of the computer anxiety aspect, it is found that the anxiety level of the teachers coming from the mathematical fields is significantly lower than those coming from the social science fields. It has also been discovered that there are significant changes in the technophobia levels for all of the independent variables related to experience and self-efficacy. Based on these findings, Bardakci, Alarkurt, and Samsa (2013) concluded that anxiety predispositions are reduced as the computer related experiences of teachers increase and their self-efficacy perceptions are improved.

In yet another study of the experience issue, Barrier and Margavio (2014) found that in their study of the attitudes towards computers, experience in itself does not equate with expertise, as the latter will depend on the quality of the experience. Furthermore, there is the issue of whether the experience is relevant to subsequent tasks and activities, and if the user can generalise from one application to the next.

Dupagne and Krendl (2010) found that computer experience often nurtures positive attitudes towards usage of ICTs; likewise, the lack of training often accounts for teachers' low confidence level when they initiate computer activities. This feeling of low confidence often results in high anxiety towards computers. High anxiety can lead to negative attitudes, and eventually negatively influence the learning process.

Studies revealed that there is a correlation between computer experience to positive attitudes (Chou, 2012; Gaudron & Vignoli, 2010; Ropp, 2013; Woodrow, 2012; Yildirim, 2013). For example, Woodrow (2012) reported correlations between computer experience and attitudes toward computers. Ropp (2013) found that there is significant relationship between computer access and hours of computer use per week, and attitudes.

Abas (2013) conducted a study to investigate the attitudes towards using computers among Malaysian student teachers. Teachers' attitudes have been found to be a major predictor of the use of new technologies in instructional settings. Christensen (2012) stated that teachers' attitudes toward computers affect not only their own computer experiences, but also the experiences of the students they teach. In fact, it has been suggested that attitudes towards computers affect teachers' use of computers in the classroom, and the likelihood of their benefiting from training. Positive attitudes often encourage less technologically capable teachers to learn the skills necessary for the implementation of technology-based activities in the classroom.

Asan (2013) investigated teachers' perceptions and awareness levels about specific technologies, the role of technology in education, and how they see technological problems that are faced by basic education systems in Turkey. The results showed that many teachers were not computer users and lacked a functional computer literacy background upon which to build new technology and skills. The study also indicated that the use of computer and related technologies was not a routine part of their teaching and learning environment.

In another study, Canvas (2012) investigated science teachers' attitudes toward Computer Assisted Learning (CAL). The results revealed that the majority of science teachers had positive attitudes toward CAL, and no gender difference exists between science teachers' computer-assisted learning attitudes. Ocak and Akdemir (2013) expressed that science teachers' computer literacy level is related to their computer use. Also, the computer literacy level of teachers increases their integration of computer applications in their teaching. In the study, most of the teachers use internet, email and educational software CDs as computer applications in the classrooms. They found statistical differences in the interaction of computer applications as an instructional tool.

There is a relationship between teachers' attitudes toward computer technologies and their competence. In their study of the correlation between teachers' attitude and acceptance of technology, Francis-Pelton and Akdemir (2011) maintained although many teachers believe computers are an important component of a student's education, their lack of knowledge and experience lead to a lack of confidence to attempt to introduce computers into their instruction. Berner (2010) found that teachers' computer competence is a significant predictor of their attitudes toward computers. Most teachers who showed negative or neutral attitudes toward the use of ICT in education lacked knowledge and skills about computers that would enable them to make informed decisions (Al-Oteawi, 2012).

Zammit (2012) reported that a major obstacle to successful technology integration was the lack of teacher confidence and skill when using technology. Supporting this result, in the study of Akpinar (2010) where he investigated the level of primary and secondary teachers' using technological opportunities, it is concluded that half of teachers do not use computers for educational purposes in activities outside the classroom, and almost half of them never use computer software in educational activities. Again, in another study (Erdemir, Bakirci,& Eyduran, 2011), pre-service teachers stated that they do not feel themselves adequate enough in skills and knowledge for using internet and computers for the purpose of teaching, and while they felt that they are adequate for using search engines, they can only prepare basic materials for teaching but not complex and multi-purpose educational devices.

With regard to educational aspects, Igbaria and Parasuraman (2010) revealed education as having a pessimistic relationship to computer anxiety, andan explicit association with computer attitudes. Likewise, Howard and Smith (2013) established that the deficiency of education and familiarity of computers could bring about operational fear about utilising computers and computer software. The study reveals that an expansion in education reduces computer anxiety and nurtures a feeling of self-effectiveness. Moreover, McQueen and Mill (2009) maintained that teachers' educational level had a positive influence on computer self-effectiveness, so teachers with an immense level of education and training had an additional amount of certainty in their proficiency for the use of new technologies.

The fact that computer based technologies affect the professional and social life in almost every facet of society makes technophobia a psychological variable that needs to be focussed on. Studies conducted with groups such as teachers, police, students, and civil servants who have had to interact with these technologies in their professional lives throughout the nineties indicate that almost one third of them demonstrate technophobia predispositions (Marcolulides, Mayers,& Wiseman, 2011; Chua,

Chen,&Wong, 2011; Rosen & Maguire, 2012; Brosnan & Thorpe, 2011). Brosnan (2012) explained the reasons of technophobia based on the technology acknowledgement model developed by David (1986).

According to Brosnan (2010), computer related concerns are in relation with attitude, self-efficacy perceptions, and the underlying experiences. There are many studies on the relations between the technophobia predispositions and the elements like age, gender, ethnic origin, negative cognition developed against the computer technologies in the early age, academic major, computer ownership, and cognitive orientation (Kuskaya-Mumcu & Altun, 2011; Rosen & Weil, 2012; Gilbert, Lee-Kelley & Barton, 2013; Rosen & Maigure, 2012; Brosnan & Thorpe, 2010; Brosnan & Davidson, 2009; Rosen, Sears & Weil, 2011; Korukonda, 2012; Chou, 2011).

Clinical studies on technophobia reveal that individuals with a predisposition towards technophobia possesses six basic phobia indicators. These are excessive and baseless fear of information technologies, showing constant anxious reactions when subjected to these technologies, avoidance of technologies, otherwise tolerating them with a high level of anxiety, avoidance that hinders academic, professional and/or social life, or causes stress, and that this condition lasts at least for six months (Brosnan, 2010; Brosnan and Thorpe, 2010).

Kuskaya-Mumcu and Altun (2011), however, suggest five basic indicators related to technophobia based on different definitions. These are finding technology complex and useless, avoidance from or resistance against technology, high level of anxiety, negative attitude against technology, and hatred for technology. Accordingly, the existence of one or more of these indicators in an individual, in different ways and intensities, indicates technophobia. Korukonda (2012) similarly emphasises the fact that

a technophobia predisposition, and therefore its indicators, may exist at different individuals, with different levels.

Skills and attitudes are further deliberations in effective ICT usage by teachers in the classroom. Researchers argue that the skills and attitudes of teachers can enable the success of technology integration into the curriculum (Bitner & Bitner, 2010; Davidson & Elliot, 2013;McGarr,2012), if, when teachers commence developing proficiency, they are ready to exchange their capabilities and reveal them to others, including their colleagues. Also, in their study of 185 elementary, and 204 secondary teachers' use of computer as instructional instrument in Canada, Mueller, Wood, Willoughby, Ross and Specht (2011) revealed that attitudes and beliefs have a positive impact on the fruitful integration of Information and Communication Technologies in the classroom, as well as on teachers' under-use of modern technology. Teachers should be required to be accredited by learning to use technology, and in particular, by utilising technologies to alter their teaching models and those of their colleagues. This is predominantly challenging in remote and deprived areas, where change is often problematic.

In countries such as Lesotho, an additional problematic issue is the lack of role-models for the efficient incorporation of ICTs into the curriculum and subject teaching (UNESCO, 2010).

2.4 Studies on the relationship between anxiety and availability or non-availability of technology

Among issues which occur in the present study is the relationship between anxiety and availability or non-availability of technology. These aspects have been extensively studied among teachers in Turkey and Iran.

Albion and Ertmer (2013) observed among teachers in their sample that technology adoption is often not attained, meaning that the partaking teachers employed technology for restricted tasks but not for instructional purposes. For example, McCannon and Crews (2012) discovered that most of elementary school teachers, who contributed in their study, utilised computers to do managerial tasks, and not as an integral part of the student learning process.

Recent studies have revealed several barriers that impede teachers from adopting technology. The earliest study acknowledged the lack of availability and access as one of the principal obstacles obstructing teachers from utilising technology (Ertmer, Addison, Lane, Ross, & Woods, 2010; Guha, 2012; Pelgrum, 2013: Wang & Chan, 2014). According to these studies, the first requirement that must be in position before teachers can use ICTs in the classroom is that the resources must be available and accessible. However, this requirement seems to be more progressively satisfied as ICTs have entered the classroom more unanimously.

Guha (2012) found that the non-availability of technology and resources is no longer considered to be a major barrier to teachers' technology adoption. However, this finding may demonstrate that this barrier may still exist in underdeveloped or developing countries like Lesotho where the monetary resources required to present ICTs into schools are inadequate.

According to the report of International Society for Technology and Education (2012), comparatively few teachers (20%) illustrate feeling well organised to incorporate ICTs into classroom instruction, while the majority (80%) feel anxious to integrate technology in the teaching environment. Although ICT resources are made accessible in the classroom, numerous teachers are still hesitant of the value technology has contributed towards teaching and learning. Studies point out that the level of feelings teachers have

toward technology range from excitement to uncertainty, from hostility to fear (Berson, 2011, Saye, 2012). Some teachers show little interest in utilising instructional technology, while others are noticeably resistant to its use. Some positively admit to the idea, but feel somewhat uncomfortable by the absence of training for efficient interaction (Chill & Hortin, 2011). Still others have undecided feelings toward ICTs. Feelings of ambiguity, aggression and anxiety naturally lead to many teachers' unwillingness to utilise technical innovation.

Teachers will continue to follow their out-dated practices, with which they feel more confident and comfortable, if they are not given proper training pertaining ICTs. The effective use of ICTs enables teachers to promote and modify their instructional approaches to enhance students' learning (Teo, Lee,& Chai, 2013).

2.4.1 Computer anxiety

Reviewed literature records the existence of technophobia, and this is articulated with anxiety, detestation, or overall negative attitude towards technology. With the introduction of computers in daily life, and their fundamental comprehensive application in almost every workplace, computer anxiety or the fear towards computers, "computerphobia",is an actual phenomenon. According to Hess and Miura (2014), and Scott and Rockwell (2013), among others, computer anxiety has to do with evading the computer on several levels of encounter.

Rosen and Weil (2011) in their resolution of the key indicators of technophobia expounded the following:

- Anxiety towards any current or imminent interactions of an individual with ICTs.
- A general destructive attitude of an individual towards computers, their utility and their effect on society.
- Special, negative cognitive functions of an individual while working on a computer, or when taking into account his/her imminent relation with ICTs.

However, the degree of computer anxiety can simply change. According to researchers, reduction of computer anxiety depends on various factors such as sustained involvement or education received on ICTs (Anderson, 2013; Ayersman, 2014; Crable, Broozinski, Scherer,& Jones 2011). Rosen and Maguire (2012) revealed that there is an opposite association between the experience or knowledge on computers and computer anxiety. The literature shows that there are various studies conducted for reducing technophobia predisposition. For example, Rosen, Sears, and Weil (2011), and Brosnan and Thorpe (2010) considered technophobia as a condition of anxiety and fear created by negative experiences and environments, and one could reduce computer anxiety by taking advantage of clinical or psychological anxiety reduction techniques. The studies show that these environments might reduce the anxiety and avoidance conditions of the individuals against computer technology.

In a study on math anxiety, Skiba (2010) outlined that verbalising fears and frustrations allows students to overcome hostility towards mathematics. Thus, those students who are anxious about mathematics can share their feelings through e-mails and online bulletin boards. In this case, the internet provides a platform for cooperative learning, which offers materials that can reduce mathematics anxiety (Bernero, 2000). There are some websites that can provide students with self-help by using animation, sound and videos. Mathematics is also available in multimedia formats with online illustration.

When the numerous advantages of technology and the responsibility of teachers in Lesotho to effectively benefit from technology in today's education processes are considered, the technophobic predisposition of teachers comes forward as a condition that needs to be focused on. According to Rosen and Weil (2011), an important factor behind the avoidance of the teachers from utilising information technologies, despite the facilities available in their schools and classrooms, is the technophobia predispositions and the condition of anxiety and avoidance.

Other studies concentrate on the fact that technology related resistance and fear of teachers would have influences not only in benefiting from the information technologies, but also their condition of transferring technology literacy skills to the students. These studies also reveal the necessity to determine the causes of the fear and resistance of the teachers and produce solutions (Gurcan-Numlu, 2013; Shapka and Ferrari, 2014).

It is evident that the same procedure to reduce anxiety among Lesotho teachers can be supportive. Teacher should be informed that the reason behind integration of ICTs has nothing to do with exposing their incompetence to technology, but it is there to make their work easier and more effective.

Pyzdrowski and Sun (2015) noted that an online bulletin board system is another influential device that can be utilised to exchange information and ideas. An online discussion board is a computerised gathering or communication database where individuals can log in and leave broadcast messages for other users organised (classically) into theme groups. Bulletin board systems offer durable devices that can be utilised to diminish math anxiety both in the active and perceptive domains. Teachers and students can discuss how to resolve mathematics' problems and exchange knowledge and emotional state in order to inspire each other and to assist each other to diminish mathematics anxiety.

2.5 Computer exposure

Howie, Muller, and Paterson (2014) subscribed to the idea that teachers are pivotal in deciding the measure to which innovation is embraced and executed in educational practice. Therefore, the training and usual upgrading of teachers is significant for the merging of technology into daily educational practice. Igbaria and Iivari (2010) articulated that ICT tools' experiences are related to computer anxiety. Computer

courses are classified as part of computer experiences, but this exclude computer exposure or short term computer courses (Bradley & Russell, 2007). On their studies on meta-analysis of computer anxiety, Chua and Chen (2011) inferred that the relationship between computer anxiety and former computer experience has the most regular results.

Bradley and Russell (2007) advocated that an increase in computer experience generally reduced computer anxiety. In this case, a positive relationship is definitely expected because supplemental involvement and acquaintance with computers means having spent more time working with technologies, thus intensifying computer self-effectiveness and reducing computer anxiety. Bozionelos (2015) posited that the dimension of the correlation between tallies on computer anxiety and tallies on computer exposure weakened as tallies on computer exposure increased and tallies on computer anxiety decreased. It is therefore, evident that when teachers gain more exposure to ICTs, they are less likely to be nervous when dealing with these new technologies.

When clarifying if teachers who own personal computers have more positive attitudes and less computer anxiety than those who do not, literature reveals that teachers attending a computer course, who owned computers, did preferably better at scoring good results (Brown, Day,& Meade, 2010). In their study, Levin and Gordon (2012) also stated a positive correlation between computer attitude and computer ownership. Weil and Rosen (2011) found that an Israeli undergraduates had the least fear of technology among all respondents from 23 countries surveyed.

In their study that examined teens' use of socially interactive technologies (SITs), such as online social sites, cell phones/text messaging, and instant messaging (IM), and the role that social anxiety plays on how teens communicate with others (technologically or

face-to-face), (Nagarkoti & Kukreti, 2015) found that on average, 35–40% of teens reported using cell phones/text messaging and online social sites between 1 and 4 hours daily, 24% reported using IMs 1 - 4 hours daily and only 8% reported using email between 1 and 4 hours daily. Females tended to use cell phones/text messaging and online social sites more so than did males. Assessing gender differences and social anxiety also revealed significant differences. Results revealed females reported more social anxiety (not comfortable talking with others in person) than did males.

2.6 Training and other strategies

Tondeur et al. (2013) asserted that a fundamental approach that schools should utilise to overwhelm problems, is to pledge to the professional improvement of teachers. Training has to be cautiously planned and executed to provide unbroken succession between what is acquired by teachers and what will transpire in their classrooms, and to inspire them in transforming their practices (Zhao, Pugh, Sheldon,& Byers, 2014). Looking at the role of ICT from a complex angle, especially in computational subjects, like mathematics and sciences, Adams (2013) recommended regular organised, professional development to keep teachers updated and conscious of the need to constantly enhance their technological practices.

The professional development of teachers has consistently been addressed by holding workshops, even ones that just run for one day. Teachers however have criticised the relationship between those workshop activities and actual classroom practices (Cohen and Ball, 2012). The workshops should be cautiously premeditated to narrate the learning perspective to what happens in classrooms. The main concentration should be supporting teachers as they combine new methodologies into their instructional practices (Adams, 2015).

Martin (2012) hypothesised that, as well as teachers becoming acquainted and knowledgeable with the various aspects of new technology, they should also acquire self-confidence, and come to be critical thinkers and imaginative users of technology. Besides requiring models of most good practice and applicable information, teachers should obtain individual technological proficiency, and support the motive behind incorporating new technologies into learning. They should be able to keep up with fast technological modernisation and associated changes in practice. The rate at which students master and use computer-based learning applications should improve in a comparable fashion.

As education developers take into account methods of incapacitating the problems with regards to ICT incorporation, they should pay special consideration to guarantee that teacher's functions change, to being a facilitator, a mentor, implementer and collaborator in learning, not just an instructor (Cohen & Ball, 2012).

2.7Chapter summary

This chapter has provided an overview of related literature of previous studies on determining causes of fear of technology, exploring the relationship, if any, between qualifications and anxiety, and the relationship between anxiety and availability, or non-availability, of technology. This chapter leads to chapter three which sets out the research design of this study and explains investigations of issues discussed in the literature review.

CHAPTER THREE

RESEARCH METHODOLOGY AND DESIGN

3.1 Introduction

This chapter mainly focuses on how the research was conducted. The research study investigated anxiety associated with use of technology among teachers in Lesotho. The chapter therefore lays out the research methodology, the target population, the sampling process and sample size, research instruments, data collection, data analysis and problems experienced during the study.

3.2 Research methodology

Leedy (1998) argued that research is a procedure by which researchers attempt to find, systematically, and with the support of demonstrable fact, the answer to a question, or the resolution of a problem. Kerlinger (2002) further defined research as the systematic, controlled, empirical and critical investigation of hypothetical propositions about presumed relations among natural phenomena.

Kerlinger (2002) subsequently referred to research methodology as a set of guiding principles on how a study should be conducted. These principles include the postulates and beliefs that serve as a basis of the study and standards the study should use for data interpretation and drawing conclusions. In essence, research methodology is a researcher's approach to the research process in its entirety. Closely related to the research methodology is the research design. Barbie (1992) defined research design as the planning of any research from the first step to the last. He further stated that the

research design addresses the planning of scientific enquiry. Thus, research design is part of the entire process of the methodology.

It is therefore evident that research is any careful, systematic, patient investigation into some field of knowledge that is undertaken to establish facts and principles.

Williman (2007) upheld that the research approach determines what data is considers to be valuable. Williams further noted that the two major types of research approach are quantitative and qualitative research. Williman (2007) was of the view that quantitative research is typically found in a form of social surveys and experimental investigations, while qualitative research is usually associated with respondent observations and in-depth, unstructured interviews. This study takes both quantitative and qualitative approaches. In qualitative phase of the study, a reasonably large sample of teachers in Maseru schools was interviewed in a face-to-face encounter. The quantitative phase was a survey on the population of teachers in Maseru schools. Thus, a sample was made to answer questionnaires, and findings were analysed using the SPSS programme. This approach provided accurate results from adequate information captured from the respondents.

3.3 Study paradigm

Researchers sometimes conduct research using descriptive and field study paradigms to learn about attitudes, perceptions, opinions, beliefs, behaviours and relationships, among variables. In order to address the research questions, and to achieve the aims of the present study, a similar approach or paradigm is used.

Descriptive research paradigms or field studies are non-experimental scientific enquiries aimed at discovering the relations between, and the interactions among, sociological, psychological and educational variables in real social situations. Any research project that pursues relations, and or tests hypotheses in real-life situations as found in communities, schools, factories, organisations and institutions, can be considered to be field studies or descriptive paradigms (Kerlinger, 1992; Turney & Robb, 1971).

One of the advantages of using descriptive paradigm is that the participant is observed in a completely natural and unchanged environment (Martyn, 2008). The paradigm is not intended to ferret out cause and effect relationships, but to describe relations that already exist among variables (Grimes & Schulz, 2002; Shuttleworth, 2008; Key, 1997). A descriptive paradigm is ideal in the present study because the aim is to achieve an in-depth understanding about the anxiety associated with the use of technology among teachers. A descriptive paradigm is commonly used with field experiment methods in which data are collected to describe persons, organisations or phenomena in their natural settings (ESC & McRel, 2004).

3.4 Research method

Methods are instruments used to generate and analyse data. In fact, they are the main tools in the social sciences, and are selected based on criteria with, or even dictated by, the major components of the methodology they comprise, such as perceived reality, a definition of science, and the perceptions of the methodology they comprise, such as perceived reality, definition of science, perceptions of human beings, objective of research, and type of research units (Sarantakos, 2007).

This study employed the quantitative design. Survey research targets a sample of participants who have to individually answer the same set of questions. Using a survey,

researchers can determine a variety of variables, test multiples of hypotheses, and conclude on chronological order from responses on historical behaviour, experiences, or characteristics (Neuman, 2006).

The two methods were both used because the researcher wanted to do a thorough investigation of respondents' viewpoints. The researcher anticipated that the qualitative method would gather detailed data, which is relevant to understanding various views from participants, while the quantitative method would solicit responses that might have not been covered by the other method. Besides, using both approaches would ensure that the two methods would complement each other in terms of confirming the findings.

According to Neuman (2006), survey research allows a researcher to collect information about a population of interest without analysing the entire people. This study followed same procedure: only a small part of the population, a sample, was investigated and the results from the sample were viewed as representing the whole population. Neuman went on to define a survey as a tool used to collect data on identical objects that are evenly distributed across space, through the observation of their responses to a series of probing questions, to such a degree that the responses are consolidated to form a collective view that represents each object. Neuman stated that a survey research conducted through questions in the form of either a questionnaire (mailed or handed out to respondents), or a one-on-one interview, after which respondents' answers are recorded. The researcher cannot influence the results, unlike an experiment, as people simply answer questions. A survey researcher usually selects a sample from a population of interest, and subsequently reports the findings to be representative of the larger population.

3.5 Population

The population of this research investigation comprised of all high school teachers in the district of Maseru (the capital city of Lesotho). The researcher would have wished to include all high school teachers however, because of the limited time, limited resources and cost involved, the researcher had to limit this investigation to three schools within Maseru district. Hence, the researcher took a decision to make use of the cluster sampling technique which, according to Cohen and Manion (1989), involves collecting information from a smaller group, or subset of the population, in such a way that the knowledge gained is representative of the total population. The researcher chose cluster sampling because of the number of high school teachers, which is large and widely spread over the district of Maseru.

Neuman (2006) subscribed to the idea that a population is a large number of cases or units, such as people, organisations, or even the social circumstances being investigated. The author further defined this concept as a generalised idea of a large collection of cases, with which a researcher associates results of a sample that has been drawn from it. In essence, the word ‘universe’ is a times used interchangeably with ‘population’ (Neuman, 2006). In contrast to this, Dooley (1995) described a population as a process whereby a researcher links the whole collection of elements to the findings from their sample. The population under study is a specified group of multiple cases out of which a sample is drawn and which is represented by findings from a sample (Neuman, 2006).

3.6 Sample size

As this study was aimed at the generalisability of the findings, the sample drawn had to be representative of the population of Maseru district high schools. Du Plooy (2002)

noted that if a researcher does not aim at generalisability, there are no set rules for choosing a sample size, as this is dependent on the research objective; a large sample would be advisable is some cases, while a single case that is information-rich may suffice. Welman, Kruger and Mitchell (2005) affirmed that much larger samples are normally used in large-scale surveys than in experimental research. A good sample is one that is representative of the population from which it was selected (Gay, 1996).

Bless and Higson-Smith (2000) stated that a sample is a portion of the population that a researcher studies; they add that the characteristics of the sample will generally be a reflection of the entire population. According to Leedy and Ormrod (2005: 199), the sampling approach can be classified into two categories, that is, probability and non-probability.

Leedy and Ormrod (2005) defined probability or random selection as a technique of choosing a sample in such a way that each element of the population is equally likely to be selected. There are three types of probability sampling methods: simple random, stratified random, and cluster and systematic random. Leedy and Ormrod (2005) stated that in non-probability sampling, the sample's representation of each element of the population cannot be forecast or guaranteed. Non-probability sampling methods are the following: quota, purposive, sequential and snowball.

In this study, probability sampling, by way of random and stratified random sampling, was applied. The researcher opted for probability sampling because it has the advantage of eliminating bias, and can also reduce errors that can affect the validity of the results. According to Neuman (2006), in simple random sampling a researcher decides on a population to study, and uses a completely random procedure to select a sample so that each element in the population has an equal chance of being part of the

sample. In this study, the sample was drawn from 100 teachers in Maseru district high schools.

The researcher chose a sample from both urban and rural setting. Schools were allocated numbers. These numbers were written on a piece of paper. These pieces of paper were folded and placed in a container. Then, the contents were shuffled and the researcher took out the pieces of paper one by one, and recorded the number of the school. This process continued until the researcher obtained the designated number of schools. Within each school, sampling of teachers was purposeful.

3.7 Data collection instruments

Du Plooy (2001) argued that, in addition to the use of questions, scales and self-administered questionnaires, researchers who want to collect information by means of observations can utilise different instruments, or even design their own. Mouton (2001) stated that in order to collect data, some form of measuring instrument has to be used, hence a self-administered questionnaire was used to collect data in this study.

According to Sekaran (1990), survey questionnaires are a pre-formulated written set of questions to which respondents record their answers. Leedy (2000) agreed by stating that its basic function is to collect data. He further stated that the questionnaires must be planned or designed to fulfil a definite research objective. The questionnaire was carefully constructed in a structured manner to facilitate responses, and at the same time, obtain more detailed information.

The questionnaire was divided into two sections: Section A comprised of socio-demographic data, and Section B comprised of questions that sought to gather data that

evaluated the skill and the anxiety level of teachers on ICTs. Section A dealt mainly with biographical information, with variables pertaining to age, gender, citizenship, level of education and teaching experience.

3.8 Pilot study

Most researchers emphasise the value of pre-testing a questionnaire on a small population before research techniques can finally be put into operation, known as a pilot study, pilot work or pilot run. The pilot study is an abbreviated version of a research project in which the researcher practises or tests the procedures to be used in the subsequent full-scale research project (Dane, 1990). It was therefore necessary that pilot work be conducted because it was a trial-run which would assist the researcher to make a decision whether the research project is feasible and whether it is worthwhile to proceed.

According to Williman (2001), a questionnaire study must be conducted on a test sample before the actual study begins. William maintained that it is advisable to test a questionnaire on a sample that has similarities to the population of interest, in order to be aware of any problems or challenges that may arise during the study. Therefore, a pilot study was undertaken to find out if there were any difficulties or confusion that the respondents of this study were likely to face.

For the purpose of this study, a trial run questionnaire was administered to teachers in a high school. These teachers were drawn from a school not selected for the main study. The basic purpose of a pilot is to determine how the design of the subsequent study can be improved, and to identify flaws in the measuring instrument (Mchunu, 2009). Furthermore, a pilot study provides the researcher with an idea of what the method will actually look like in the operation, and what effects (intended or not) it is likely to have.

This implies that by generating many of the practical problems that will ultimately arise, a pilot study enables the researcher to avert these problems by varying procedures, instructions and questions. The results of the pilot suggested that a few changes were necessary. Some of these items had to be re-worded after certain teachers left out some of the crucial questions. Indeed, this trial run proved to be invaluable in refining the instrument.

Through the utilisation of the pilot study as a “pre-test”, the researcher was satisfied that the questions asked in the questionnaire compiled adequately with the requirements of the study.

3.9 Validity and reliability of the research instrument

There are two concepts that are of critical importance in understanding issues of measurement in social sciences research, namely validity and reliability (Huysamen, 1989). Validity and reliability are especially important in educational research because most of the measurements attempted in this area are obtained indirectly. It is therefore necessary to assess the validity and reliability of this instrument. An educational researcher is expected to include in his or her research a report of an account of the validity and reliability of the instrument he or she has employed. Reliability is associated with the consistency of measure, and validity is related with accuracy. If there are any interpretations of the findings, the credibility of the study must be recognised through the determination of its reliability and validity (Joseph, Rabin, Money, & Samuel, 2003).

3.9.1 Validity of an instrument used in this research study

For validity purposes, the researcher made attempts to validate the research instrument. The researcher submitted the questionnaire to the supervisor. As an expert

in the field of Educational Psychology, the supervisor examined the research instrument of the study. The supervisor looked at the grammar, wording and the structure of the instrument (face and content validity) and comments were made on the instrument for the attention of the researcher. The researcher attended to the comments, and changes were made to the instrument. The supervisor also attended to the content of the instrument to ensure that it fell in line with the objectives of the current study. Kumar (2013) was of the opinion that an instrument is measuring what it is supposed to measure is primarily based upon the logical link between the questions and the objectives of the study.

Coolican (1992) affirmed that an effect or test is valid if it measures what the researcher thinks or claims it does. Du Plooy (2002) stated that face validity, expert-validity, criterion-based validity, and construct validity are various procedures or methods that could be used to support the validity of a measurement. For the purpose of the present study, construct validity was used to support the validity. When something is measured with an instrument, the instrument used to measure a variable must measure that which it is expected to measure. This requirement is referred to as the construct validity of the scores obtained on a measuring instrument. This concludes that construct validity involves a measuring instrument to some overall theoretical framework to make certain that the measurement is actually logically correlated to other concepts in the framework (Welman, Kruger, & Mitchell, 2008).

3.9.2 Reliability of an instrument used in this research study

Mchunu (2009) maintained that reliability is a statistical concept and relates to consistency and dependability. Consistency refers to the constancy of obtaining the same relative answer when the measuring instrument is one that, if repeated under similar conditions, would present the same result, or near approximation of the initial result.

With regard to reliability of the research instrument, Golafshani (2003) pointed that “to ensure reliability in qualitative research, examination of trust worthiness is, therefore crucial.” Coetzee (2008) stated that a good research depends to a large degree upon the reliability (consistency), and validity (precision) of the instrument used to collect data to accurately measure the variables of interest. The instrument that was used was reliable because results from the pilot study were near approximation of the main study. To maintain reliability, the researcher used closed ended questions, where respondents had to choose answers.

When the questionnaire is used as an empirical research instrument there is no specific method, for example the “test-retest” method, to determine the reliability of the questionnaire. Therefore, it would be difficult to establish to what extent the answers of the respondents were reliable. The researcher, however, believes that the questionnaire in this investigation was completed with necessary honesty and sincerity required to render the maximum possible reliability. Frankness in responding to questions was made possible by the anonymity of the questionnaire. In the coding of the responses to the questions it was evident that the questionnaire was completed with the necessary dedication, thereby leaving the researcher to believe that the questionnaire used for the purpose of the present study was reliable.

3.9.3 Ethical consideration

The present study focused on high school teachers. The researcher, therefore, bore in mind that whenever human beings are the focus of investigation, ethical implications of what is proposed to be done should be considered (Leedy & Ormrod, 2005). These researchers further stated that, “most ethical issues in research fall into one of the four categories: protection from harm, informed consent, right to privacy, and honesty with professional colleagues.”

In the same manner, Kumar (2005) asserted that, “it is considered unethical to collect information without the knowledge of the participants, and their expressed willingness to informed consent.” Staying informed “is probably the most common methods in medical and social research” (Mchunu, 2009). Informed consent implies that respondents are made adequately aware of the type of information wanted from them, why the information is being sought, what purpose it will be put to, how they are expected to participate in the study and how it will directly or indirectly affect them (Kumar, 2013). Further, Kumar (2013) stated that “it is important that consent should be voluntary and without pressure of any kind”.

Imenda and Muyangwa (2006) stated that under standards set by the National Commission for the Protection of Human Subjects, all informed-consent procedures must meet three criteria: participants must be competent to give consent; sufficient information must be provided to allow for a reasoned decision; and consent must be voluntary.

Competency, according to Schinke and Gilchrist (1993), “is concerned with the legal and mental capacities of participants to give permission”. For example, this could include some very old people, those suffering from conditions that exclude them from making informed decisions, people in crisis, people who cannot speak the language in which the research is being carried out, people who are dependent upon others for a service and children are who considered competent (Kumar, 2013).

The researcher, therefore, wrote a letter to the Ministry of Education seeking permission to conduct a study. The researcher then wrote another letter to the principals of the schools, and finally to the respondents, requesting them to partake in the study. It was mentioned that participation in the present study was voluntary. The letter contained the following information:

- A brief description of the nature of the study;
- The researcher's name, plus information about how the researcher can be contacted, and
- An offer to provide detailed information of this study if need be.

3.10 Chapter summary

The chapter has discussed the research procedure employed in the study. It focuses on the methodology used to conduct the empirical study. It explains the research design that was used, the methods, and the instrument used for collection of data, as well as techniques which are used for analysis. The next chapter provides a foundation for the analysis and interpretation of raw data, which leads to the findings of the study.

Chapter Four

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The previous chapter discussed the methods used to conduct the research. This chapter presents the analysis and interpretation of the data obtained from the target population. The aim of the chapter is to analyse and interpret the responses in order to make the data meaningful. The study aimed to investigate the anxiety associated with the use of technology among teachers in Lesotho. Data analysis does not provide entire answers to research questions but it is does provide data interpretation that clearly outlines the achievement of objectives set and provides useful answers. The study targeted Lesotho teachers. Statistical and graphical techniques were used in order to make captured data more understandable. As mentioned in chapter one, the statistical package for the social sciences (SPSS) has been used for data analysis. The results obtained will be discussed alongside with relevant literature regarding the anxiety associated with the use of technology, as well as the hypotheses that the researcher had put forward.

4.2 Administration of the scale

The scale was administered to one hundred teachers. The composition of the final study was as follows:

Table 1: Distribution of subjects – final study sample

AGE	20 – 25 years	26 – 30 years	31 – 40 years	41 years and above		*n*
	18	23	43	16		*n = 100*
GENDER	Males			Females		
	46			54		*n = 100*
CITIZENSHIP	Mosotho			Foreign national		
	98			2		*n = 100*
LEVEL OF EDUCATION	Diploma	B.Ed. Degree	Honours Degree	Masters	Other	
	26	56	12	5	1	*n = 100*
TEACHING EXPERIENCE	1 – 10 years	11 – 20 years	21 – 30 years	31 years and above		
	63	23	13	1		*n = 100*

The validity of the instrument was determined using the KMO and Bartlett test from SPSS as shown in the table below:

Table 2:KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy.		.865
Bartlett's test of sphericity	Approx. Chi-square	1453.895
	Df	190
	Sig.	.000

To verify that data is suitable for factor analysis, it is advised that the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) is value .6 or above, and that the Bartlett's Test of Sphericity is significant. The value should be .05 or smaller. In the present study, the KMO value is .865 and Bartlett's test is significant (p = .000), hence factor analysis is appropriate.

Table 3: Reliability statistics

Cronbach'salpha	Cronbach's alpha based onstandardized items	Number of Items
.508	.360	20

Cronbach's alpha value shown in the Table 3 is 0.508 suggesting internal consistency reliability is relatively weak. However, all the items were found to be valid. The weak Cronbach which is 0.192 off the mark is compensated by the strong validity of the scale which has a 0.865 KMO value.

4.3 Analysis of hypotheses

A total score for each participant was attained by summing all his or her scores to individual items. There were twenty items altogether. It was explained in Chapter Three that respondents who obtain the mean score and above will be labelled a high anxiety group, and those who are below the mean score will be a low anxiety group. A general mean score was obtained by adding total scores for respondents and dividing this sum by the number of cases, i.e., ΣX = 6800, and n = 100, therefore the general mean is 68.

4.3.1 Teachers do not differ in their anxiety levels in relation to technology

Reiteration of hypothesis number one:

"There is no difference in teachers' anxiety levels in relation to technology."

Here the research explored whether there is a difference in teachers' anxiety levels in relation to technology. A χ^2 one-sample test was used since the data is classificatory. This statistical technique is described by Siegel (1956).

The null hypothesis to be tested is:

H_0: Educators do not differ in their anxiety levels in relation to technology.

H_1: Educators differ in their anxiety levels in relation to technology.

Table 4: Frequency distribution of respondents' anxiety levels in relation to technology (n = 100)

	High	Low
oi	83	17
ei	50	50
χ^2 = 43.56	df = 1	p>0.05

A χ^2 value of 43.56 was obtained. A χ^2 value of 43.56 at df = 1 is greater than the chosen level of significance, i.e., alpha = 0.05. Since the obtained χ^2 value is far larger than the previously set level of significance, we reject H_0 with a large measure of confidence and uphold H_1. Educators do differ in their anxiety levels in relation to technology.

4.3.2 There will be a significant relationship between anxiety and respondents' biographical data

4.3.2.1 Relationship between age and anxiety

Reiteration of Hypothesis number 2.1:

"There will be a significant relationship between anxiety and the age of respondent."

The research hypothesis sought to test whether or not there will be relationship between teachers' anxiety and their age. Table 5 presents a frequency distribution of respondents' relationship between age and anxiety. A test suitable for testing for the significance of difference among three or more unrelated groups is χ^2 test for k-independent samples.

The null hypothesis to be tested is:

H_0: There is no significant relationship between age and anxiety.

H_1: There is a significant relationship between age and anxiety.

Table 5: Relationship between age and anxiety (n =100)

Age	High	Low	Total
20 – 25 years	16 (14.58)	2 (3.42)	18
26 – 30 years	22 (18.63	1 (4.37)	23
31 – 40 years	28 (18.63)	15 (8.17)	43
41 +	15 (12.96)	1 (3.04)	16
Total	81	19	100
χ^2 = 12.66	df = 3	p>0.05	

The ages of the respondents were grouped into four: those between 20-25 years, 26-30 years, 31-40 years and 41 years and above. The results in Table 5 demonstrate that the majority of the respondents (81) displayed were found to have anxiety towards technology. The obtained χ^2 value of 12.66with 3 degrees of freedom is greater than tabled critical value of 7.815, which is significant at the 0.05 level. We therefore reject H_0 and uphold H_1, and conclude that there is no significant relationship between age and anxiety.

4.3.2.2 Relationship between gender and anxiety

Reiteration of Hypothesis number 2.2:

“There will be a significant relationship between anxiety and the variable of gender of respondent.”

The respondents comprise of 46 male, and 54 female educators. Here the researcher wished to determine whether there is any connection between the gender of respondents and anxiety. The assumption is that the two groups, namely male and female educators, were drawn from a homogeneous population. A statistical technique suitable for analysis of data which was categorised and cast in a 2 x 2 table, is the 2 x 2 contingency table as Siegel (1956) recommends.

The null hypothesis to be tested is:

H_0: There is no significant relationship between gender and anxiety.

H_1: There is a significant relationship between gender and anxiety.

Table 6: Relationship between variable of gender and anxiety (n = 100)

Gender	High	Low
Male	33 (37.26)	13 (8.74)
Female	48 (43.74)	6 (10.26)
Total	81	19
$\chi^2 = 4.74$	df = 1	p > 0.05

The chi-square test was performed for k-independent samples at alpha = 0.05; df = 1.Thetabledvalue of 3.841 was against the calculated χ^2 value of 4.74.

Since the observed value is greater than the tabled critical value, the decision is to reject H_0, and uphold H_1. There is significant relationship between anxiety and the variable of gender.

4.3.2.3 Relationship between the variable of nationality of the respondent and anxiety

Reiteration of Hypothesis number 2.3:

"There will be a significant relationship between anxiety and the variable of nationality of respondent."

To test this hypothesis, χ^2 one sample test will be used since data are classificatory. This test is described by Siegel (1956).

The null hypothesis to be tested is:

H_0: There is no significant relationship between nationality and anxiety.

H_1: There is a significant relationship between nationality and anxiety.

Table 7: Relationship between variable of nationality and anxiety (n = 100)

Nationality	High	Low
Mosotho	77 (76.44)	21 (21.56)
Foreign national	1 (1.56)78	1 (0.44)22
Total	78	22
$\chi^2 = 0.91$	df = 1	p > 0.05

A χ^2 of 0.91 was obtained for the relationship between variable of nationality and anxiety. The calculated χ^2 value is smaller than the tabled critical value of 3.841, at df = 1; α = 0.05, and therefore the decision is to accept H_0 and reject the alternative hypothesis. Nationality has no effect on anxiety.

4.3.2.4 Relationship between the variable of respondent's level of education and anxiety

Reiteration of Hypothesis number 2.4:

"There will be a significant relationship between anxiety and the variable of educational level of respondent."

Here the researcher wants to establish whether there is a correlation between the level of education of respondent and anxiety. To test the above hypothesis, the χ^2 test for k independent samples described by Siegel (1956) will be used.

The null hypothesis to be tested is:

H_0: There is no significant relationship between level of education and anxiety.

H_1: There is a significant relationship between level of education and anxiety.

Table 8: Relationship between level of education and anxiety (n = 100)

Level of education	High	Low
Diploma	23 (20)	2 (5)
B.Ed.	43 (45.6)	57 (11.4)
Hons.	8 (9.6)	4 (2.4)
M.Ed.	5 (4)	0 (1)
Other	1 (0.8)	1 (0.2)
Total	80	20
$\chi^2 = 191.09$	df = 4	p > 0.05

The obtained χ^2 value of 191.09 at df = 4, α =0.05 is far greater than the tabled critical value of 9.488. Therefore, the decision is to reject *H0* and uphold the alternative

hypothesis, therefore the results are not significant. There is a relationship between anxiety and the educational level of respondent.

4.3.2.5 Relationship between the variable of respondent's teaching experience and anxiety

Reiteration of Hypothesis number 2.5:

"There will be a significant relationship between the variable of teaching experience of respondent and anxiety."

To test for the effect of teaching experience on anxiety, the χ^2 test described by Siegel (1956) will be used.

The null hypothesis to be tested is:

H_0: There is no significant relationship between teaching experience and anxiety.

H_1: There is a significant relationship between teaching experience and anxiety.

Table 9: relationship between teaching experience and anxiety (n = 100)

Teaching experience	High	Low
1 – 10 years	52 (51.3)	11 (11.97)
11 – 20 years	18 (18.63)	5 (4.37)
21 – 30 years	10 (10.57)	3 (2.47)
31 +	1 (0.18)	0 (0.19)
Total	81	19
$\chi^2 = 120.81$	df = 3	p > 0.05

A chi-square test for independent samples was performed to test whether there was a significant relationship between teaching experience and anxiety. A calculated chi-

square value of 120.81 was obtained, when df = 3 and alpha = 0.05. Since the observed χ^2 value is greater than the tabled critical value of 7.815, the decision is to reject null hypothesis with a large measure of confidence, and uphold the alternative hypothesis. There is a significant relationship between teaching experience and anxiety.

4.4 Chapter summary

This chapter has presented the results of the study. The findings of the study were explained and demonstrated by use of figures and tables in order to show the data meaningfully. The statistical package for the social sciences (SPSS) has been used for data analysis. The results obtained were discussed, along with relevant literature regarding anxiety associated with the use of technology, as well as the hypotheses that the researcher had put forward. The following chapter draws conclusions and suggests recommendations that would promote usage of ICTs in schools.

Chapter Five

Summary, recommendations and limitations

5.1 Introduction

In this concluding chapter of the study, a brief summary of the previous chapters will be presented together with the findings from the data collected. This chapter will be concluded with recommendations and anticipated criticisms that originate from the study. In order to determine whether the objectives of the study have been achieved, the research questions and aim will be examined in relation to the findings.

5.2 Summary

5.2.1 The problem of study

This study was designed to investigate anxiety associated with the use of technology among teachers in Lesotho.

5.2.2 The aims of study

(a) To determine if educators differ in their anxiety levels in relation to technology.
(b) To establish the relationship, if any, between the use of technology and anxiety.
(c) To find out whether anxiety is associated with the availability, or non-availability, of technology.

5.2.3 The following hypotheses were formulated:

(a) Educators do not differ in their anxiety levels in relation to technology.
(b) There will be a relationship between the use of technology and anxiety.
(c) There will be a relationship between anxiety and exposure to technology.

5.3 Methodology

Chapter one consisted of the motivation for investigation in this field, while chapter two comprised of a review of previous work done in this area. Chapter three detailed the method of study used in this research. The measuring instrument was a Likert-type of scale. The researcher submitted the instrument to experts for the purpose of getting expert advice, hence it was constructed and standardised by the experts. Chapter four contained the analysis of data, and in Chapter five a summary and recommendations were made.

5.4 Discussion of findings

5.4.1 Findings with regard to the differences of educators' anxiety levels in relation to technology

The present study reveals that educators do differ in their anxiety levels in relation to technology. This result is not surprising since many studies have revealed that in terms of computer anxiety aspect, the anxiety level of the teachers coming from the numeric fields is significantly lower than those coming from the social fields (Bardakci, Alarkurt, & Samsa 2013). These researchers also discovered that the anxiety levels of teachers from social and linguistics have shown that anxiety levels vary from their counterparts coming from different academic areas with regard to their qualification. It is seen that the anxiety level is influenced by the academic specialism (Bardakci, Alarkurt, & Samsa, 2013).

5.4.2 Findings with regard to the association between anxiety and the age of respondents

This study reveals that there is no correlation between age and anxiety. This result is not surprising since much of the remaining literature would suggest little or no

relationship between age and the use of technology by educators. Corresponding findings were obtained by Bradley and Russell (2011) in a study of computer experience, school support, and computer anxieties. They revealed that levels of computer proficiency, or anxiety, did not differ significantly with the subject's age. The fact that older teachers do not necessarily become more apprehensive about utilising computers, one would then propose that age is not in itself a momentous barrier to the use of ICTs by teachers. Therefore, propositions that computer anxiety increases with age are not supported by the present results. The variable of age did not influence the subjects' responses.

5.4.3 Findings with regard to the association between anxiety and the sex of respondents

In this study, a relationship was found between the variables of gender and anxiety. This finding is supported by Bradley and Russell's (2011) findings, in which sex is an indicator when it comes to the correlation between gender and levels of computer anxiety, with females reporting a greater degree of anxiety than their male counterparts.

The finding of this study, however, does not support earlier empirical findings by Pope-Davis (1991) about gender and computer attitude that found no significant correlations in college students' attitudes toward computers.

Similarly, reviewed related literature reported that among 191 prospective elementary school teachers, the female participants in the study were more positively disposed to using the internet than the male participants.

Other literature reviewed further revealed that females are more anxious, or less experienced, or less confident in ICT competence (Rekabdarkolaei & Amuei, 2008). Also, the majority of positions relating to computers are occupied by male educators (Reinen & Plomp, 2001), and female educators are more nervous and less confident about their skills (Hakkarainen, 2000).

The researcher's observation is that not all peoples of the same gender behave the same way. However, males often perceive computers as exclusively as a male domain

and it is obnoxiously assumed that males are generally intrinsically able in computer use. What exists in some Lesotho schools is that females still grapple with a lack of access to technology, and also a lack of few female role models working in ICT.

5.4.4 Findings with regard to the association between anxiety and the nationality of respondents

This study reveals that nationality has no effect on anxiety. Although association was not found between nationality and anxiety, the researcher is of the opinion that this association is expressed by a very low correlation coefficient of 0,90. However, it should be pointed out that coefficients of correlation are erratic. A correlation coefficient increases with sample size (Morgan, King, & Robinson, 1979). Should the sample increase, no doubt the correlation coefficient will be higher than the obtained coefficient.

5.4.5 Findings with regard to the association between anxiety and the level of education of respondents

The relationship between anxiety and the factor of educational level of educators are found to be existent. This finding supports many studies reviewed in chapter two. Studies reveal that the educational level of respondents had a positive influence on computer self-effectiveness, so teachers with an immense level of education and training had additional amount of certainty in their proficiency for the use of new technologies (McQueen & Mill, 2009).

However, Igbaria and Parasuraman (2010) revealed education as having a pessimistic relationship to computer anxiety, but explicit association with computer attitudes. It is undoubtedly true that education modifies one’s attitudes towards life. By the same token, it is also true that education cannot completely change a people’s outlook on life.

5.4.6 Findings with regard to the association between anxiety and teaching experience of respondents

In this study, teaching experience was found to have a significant effect on anxiety. In this case, a positive relationship is definitely expected because supplemental involvement and acquaintance with computers means having consumed more time

working with technologies, thus intensifying the computer self-effectiveness and reducing computer anxiety. Bozionelos (2015) posited that the dimension of the correlation between tallies on computer anxiety and tallies on computer exposure weakened as tallies on computer exposure increased, and tallies on computer anxiety decreased. It is, therefore, evident that when teachers gain more exposure to ICTs, they are less likely to be nervous when dealing with these new technologies.

Similarly, Woodrow (2010) found a correlation between computer experience and attitudes towards computers. In his study of exploring individual characteristics associated with learning to use computers, Ropp (2011) also reported that there is a significant association between computer access, and hours of computer use per week, and computer attitudes.

These findings are also in line with the findings by Dupagne and Krendl (2010), who stated that computer experience often nurtures positive attitudes towards usage of ICTs. Likewise, the lack of training often accounts for teachers' low confidence level when they initiate computer activities. This feeling of low confidence often results in high anxiety towards computers. High anxiety can lead to negative attitudes, and eventually negatively influence the learning process (Gulbahar, 2014).

Many studies have also reported that there has been a correlation between computer experience to positive attitudes (Chou, 2012; Gaudron & Vignoli, 2010; Ropp, 2013; Woodrow, 2012; Yildirim, 2013). For example, Woodrow (2012) reported correlations between computer experience and attitudes toward computers. Ropp (2013) found that there is significant relationship between computer access and hours of computer use per week and attitudes.

5.5 Implications of findings

The implications based on findings are presented:

- Based on finding number one, the study reveals that educators do differ in their anxiety levels in relation to technology. This is supported by Bardakci, Alarkurt and Samsa (2013), who reported that the anxiety levels of teachers from social and linguistics have shown that anxiety levels vary from their counterparts coming from different academic areas with regard to their qualifications.
- Based on finding number two, the findings reveal that there is no correlation between age and anxiety. This result is not surprising since much of the remaining literature suggests little or no relationship between age and the use of technology by educators (Bradley & Russell, 2011).
- Based on finding number three, a relationship is found between the variables of sex and anxiety. This finding is supported by Bradley and Russell's (2011) findings in which sex is an indicator when it comes to the correlation between gender and levels of computer anxiety, with females reporting a greater degree of anxiety than their male counterparts. However, other investigators hold different views. Earlier empirical findings by Pope-Davis (1991) about gender and computer attitude found no significant correlations in college students' attitude toward computer.
- Based on finding number four, the findings reveal that nationality has no effect on anxiety. Although an association is not found between nationality and anxiety, the researcher is of the opinion that this association is expressed by a very low correlation coefficient of 0,90.
- Based on finding number five, the relationship between anxiety and the factor of educational level of educators are found to be existent. This finding is also in line with the findings by Dupagne and Krendl (2010), who stated that computer experience often nurtures positive attitudes towards usage of ICTs.

5.6 Limitations of the study

The study was limited to one district. It is possible that teachers in different locations will respond differently. Thus, the results may not be generalized to the larger population. The researcher had time constraints so could not secure a sizeable population sample. There were limitations emanating from the data collection method. Other educators did not respond to all the statement in the instrument which leads to some of the questionnaire being discarded. Some schools returned the instruments long after the stipulated time. Schools are very far from one another.

In spite of the limitations mentioned above, this study has a high applicability. The researcher chose a researchable topic, and the variables introduced in this study lend themselves to measurement, analysis and meaningful interpretation.

5.7 Recommendations

Based on the findings and the discussions of the study, recommendations have been made which could point to avenues for future research. These recommendations include the following:

- Government at various levels should equip teachers with the necessary tools, such as computer laboratories and technical assistance that would enhance their computer literacy.
- The Ministry of Education and Training should endeavour to ensure that schools are internet networked so as to encourage more teachers' to access computer technologies for present and future use, since frequent use of computers is an antidote to computer anxiety. This will assist because an expansion in education reduces computer anxiety and nurtures a feeling of self-effectiveness.

- Adequate training in technical problems, and in understanding the basic workings of the technology, should be provided to teachers to allow them to make use of computers in their work.

5.8 Avenues for future study

It is pertinent to mention that this study is not complete. Therefore, it is suggested that other scholars could concentrate on teachers of other sectors of education, such as primary school, and in other districts of Lesotho. In this manner, the geographical scope of subsequent research can be widened so as to give for a higher tendency of result generalisation. In addition, further study into the barriers that exist in the uptake of ICT by teachers could be researched, in order to further the study of anxiety associated with the use of technology among teachers in Lesotho. This study can also be replicated in other social and cultural contexts different from those in Lesotho.

5.9 Chapter summary

This chapter presented a brief summary of the previous chapters, together with the findings from the data collected. The chapter also concluded with offering recommendations and any anticipated criticism which may originate from the study. The research questions and aims were examined in relation to the findings in order to establish whether the objectives of the study had been achieved.

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ANNEXURES

ANNEXURE 1: Information sheet

For office use only: Respondent Number: _____

Information sheet

Anxiety associated with the use of technology among teachers in Lesotho

University of Zululand

Faculty of Education

Department of Educational Psychology & Special Education

Researcher: Tlaba David Tlaba

Supervisor: Prof. P.T. Sibaya

Co-Supervisor: Prof. D.C. Sibaya

Note to the respondent

- Although I would require your assistance, you are not forced to take part in this survey.
- If you do not desire to take part, please hand in the blank questionnaire at the end of the survey session.
- Your remarks in this questionnaire will remain private and confidential. No one will be able to trace your responses back to you as a person.

- Before completing this questionnaire, you need to give me written permission to use your responses. It will be the first step that you will undertake on the next page. I have to assure you that this is a confidential survey and that your name will not be linked to your responses.

The questionnaire as two parts:

Section A deals with some personal information that will be required to assist in this research. Please not that this is a confidential and voluntary participation.

Section B requests your responses on how you feel when using Information, Communication and Technologies.

How to complete the questionnaire:

1. Tell me how you feel. Your responses are important to me.
2. Read each question carefully and take a moment to ponder each answer.
3. Please use a pen to mark your responses by placing a tick (✓) or a cross (X), in the appropriate column, or by writing down the appropriate information, where ever required.
4. Please do not change any of your responses afterwards (for instance: do not scratch out or tippex any of your responses).

Thank you for your participation.

TLABA DAVID TLABA

✉ PO BOX 672, Teya-teyaneng, 200, Lesotho.

(+266) 5307 8555

(+27)83 345 8085

dave.tlaba@gmail.com

ANNEXURE 2: Consent form

Project Title: *Anxiety associated with the use of technology among Teachers in Lesotho*

Name, position and contact address of researcher: Tlaba David Tlaba

(+266) 5307 8555 / (+27) 83 345 8085. dave.tlaba@gmail.com

	Please initial box
1. I confirm that I understand the contents of the covering letter and the nature of the research project and consent to participating in the research project by completing the attached questionnaire.	☐
2. I am aware that the answers I provide in the questionnaire will contribute towards research regarding anxiety associated with the use of technology among teachers in Lesotho	☐
3. I am also aware that my anonymity is guaranteed. I am also aware that I am at liberty to withdraw from the project at any time prior to the publication of the result.	☐

Please Note: indicate Yes or No only if the following statements, if appropriate, or delete this section from the consent form:

	Please tick box	
	Yes	**No**
4. I agree to the interview / focus group / consultation being audio recorded	☐	☐
5. I agree to the interview / focus group / consultation being video recorded	☐	☐

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

ANNEXURE 3: Questionnaire

Questionnaire

SECTION A: Personal Information

This section deals with some personal information that will be required to assist in this research.

1. YOUR AGE	Tick (✓) or a cross (X)	OFFICIAL USE
20 to 25 years		1
26 to 30 years		2
31 to 40 years		`3
41 years and above		4

2. GENDER	Tick (✓) or a cross (X)	OFFICIAL USE
I am a MALE		1
I am a FEMALE		2

3. CITIZENSHIP	Tick (✓) or a cross (X)	OFFICIAL USE
Mosotho		1
International		2

4. Level of Education (Diploma, B.Ed, etc)	

5. How long have you been teaching?	Tick (✓) or a cross (X)	OFFICIAL USE
1 to 10 years		1
11 to 20 years		2
21 to 30 years		`3
31 years and above		4
Other		5

SECTION B

Please insert a tick(✓) or a cross (X)on the box that corresponds to your response.

The following questions ask how you feel about using computers. For each statement, please place a tick (✓) or a cross (X) on the appropriate box that best describes your current belief.

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
1. I feel insecure about my ability to interpret a computer printout.					
2. I look forward to using a computer on my job.					
3. I do not think I would be able to learn computer skills.					
4. I do not think I would be able to learn a computer programming language.					
5. The challenge of learning about computers is exciting.					
6. I am confident that I can learn computer skills					
7. Anyone can learn to use a computer if they are patient and motivated.					
8. Learning to operate computers is like learning any new skill – the more you practice, the better you become.					
9. I am afraid that if I begin to use computers I will become dependent upon them and lose some of my reasoning skills.					
10. I feel that I will be able to keep up with the advances happening in the computer field.					
11. I dislike working with machines that are smarter than I am.					

12. I feel apprehensive about using computers.					
13. I have difficulty in understanding the technical aspects of computers					
14. It scares me to think that I could cause the computer to destroy a large amount of information by pressing the wrong key.					
15. I hesitate to use a computer for fear of making mistakes I cannot correct.					
16. You must be a genius to understand all the special keys contained on most computer keyboards.					
17. If given the opportunity, I would like to learn about and use computers.					
18. I have avoided computers because they are unfamiliar and somewhat intimidating to me.					
19. I feel computers are necessary tools in both educational and work settings.					
20. I believe computers can help solve society's problems					

Adapted from Rosen and Weil (1988)

Your assistance in this research is highly appreciated.

ANNEXURE 4: Ethical clearance certificate

UNIVERSITY OF ZULULAND
RESEARCH ETHICS COMMITTEE
(Reg No: UZREC 171110-30- RA Level 01)

RESEARCH & INNOVATION
Website: http://www.unizulu.ac.za
Private Bag X1001
KwaDlangezwa 3886
Tel: 035 902 6887
Fax: 035 902 6222
Email: MangeleS@unizulu.ac.za

ETHICAL CLEARANCE CERTIFICATE

Certificate Number	**UZREC 171110-030-RA Level 01 PGM 2014/111**						
Project Title	**A study of anxiety associated with the use of technology among teachers in Lesotho**						
Principal Researcher/ Investigator	TD Tlaba						
Supervisor and Co-supervisor	Prof PT Sibaya		Prof DC Sibaya				
Department	Educational Psychology and Special Education						
Nature of Project	Honours/4th Year		Master's	x	Doctoral		Departmental

The University of Zululand's Research Ethics Committee (UZREC) hereby gives ethical approval in

Special conditions: (1) The Principal Researcher must report to the UZREC in the prescribed format, where applicable, annually and at the end of the project, in respect of ethical compliance.
(2) Documents marked "To be submitted" (see page 2) must be presented for ethical clearance before any data collection can commence.

The Researcher may therefore commence with the research as from the date of this Certificate, using the reference number indicated above, but may not conduct any data collection using research instruments that are yet to be approved.

Please note that the UZREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the documents that were presented to the UZREC
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

Classification:

Data collection	Animals	Human Health	Children	Vulnerable pp.	Other
X					
Low Risk		Medium Risk		High Risk	
		X			

The table below indicates which documents the UZREC considered in granting this Certificate and which documents, if any, still require ethical clearance. (Please note that this is not a closed list and should new instruments be developed, these would require approval.)

Documents	Considered	To be submitted	Not required
Faculty Research Ethics Committee recommendation	X		
Animal Research Ethics Committee recommendation			X
Health Research Ethics Committee recommendation			X
Ethical clearance application form	X		
Project registration proposal	X		
Informed consent from participants	X		
Informed consent from parent/guardian			X
Permission for access to sites/information/participants	X		
Permission to use documents/copyright clearance			X
Data collection/survey instrument/questionnaire	X		
Data collection instrument in appropriate language		Only if necessary	
Other data collection instruments		Only if used	

The UZREC retains the right to

- Withdraw or amend this Certificate if
  - Any unethical principles or practices are revealed or suspected
  - Relevant information has been withheld or misrepresented
  - Regulatory changes of whatsoever nature so require
  - The conditions contained in this Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project

The UZREC wishes the researcher well in conducting the research.

Professor Rob Midgley
Deputy Vice-Chancellor, Research and Innovation
Chairperson: University Research Ethics Committee
20 August 2014

CHAIRPERSON
UNIVERSITY OF ZULULAND RESEARCH ETHICS COMMITTEE (UZREC)
REG NO: UZREC 171110-30
20 -08- 2014
RESEARCH & INNOVATION OFFICE

ANNEXURE 5: Permission to undertake research study

THE KINGDOM OF LESOTHO
MINISTRY OF EDUCATION AND TRAINING

ED/X/1

11th November, 2013

Mr. Tlaba David Tlaba
Ha Mothebesoane
P.O. Box 672
Teyateyaneng
Lesotho

Dear Sir,

Re: Permission to Undertake Research Study

This serves to acknowledge receipt of your letter on the above mentioned subject.

It is my pleasure to inform you that you have been granted permission to work with teachers in your endeavour to collect data for your study on Information and Communication Technologies (ICTS).

Could you, for ease of work, give a list of schools you would like to work with in the district (s)

I also want to take this opportunity to wish you luck in your studies and look forward to working harmoniously with you as the Ministry. We hope that your success will make an important contribution to the development of the country.

MINISTRY OF EDUCATION
PRINCIPAL SECRETARY
10 DEC 2013
P.O. BOX 47, MASERU 100
TEL.: 22 323956

Yours faithfully,

K. THABANA (Mrs.)
PRINCIPAL SECRETARY

ANNEXURE 6: Letter to the Ministry of Education

Ha Mothebesoane
P.O. Box 672
Teyateyaneng
200
4th September 2013

The Principal Secretary
Ministry of Education and Training
Maseru
100

Dear Sir/Madam

PERMISSION TO UNDERTAKE RESEARCH STUDY

The above subject matter refers.

I would like to be granted permission by the Ministry of Education and Training to collect data in this very important study on Information and Communication Technologies (ICTs). I am studying towards a Masters Degree in the Faculty of Education, Department of Educational Psychology and Special Education at the University of Zululand. The title of my dissertation is: **"A**nxiety associated with the use of technology **among teachers in Lesotho."**

The objective of the study is to investigate and examine the cause fear of technology among teachers.

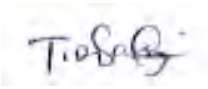
I confirm that I am a registered student with the University of Zululand.

I would appreciate it if you will grant me permission to embark on this study by sharing teacher's expertise. In the completion of the interview and questionnaire, the information furnished by teachers will make an important contribution to the success of my study.

Their contributions will be regarded as confidential and they can be assured that it will not be divulged to any person. A summary of the findings will be recorded in my dissertation which I will submit to my examiners for evaluation.

Your co-operation in this matter will be highly appreciated.

Yours faithfully



_____

Tlaba David Tlaba

Student No. 200812639

ANNEXURE 7: Letter to the respondent

Ha Mothebesoane
P.O. Box 672
Teyateyaneng
200
12th November 2013

Dear Participant,

REQUEST FOR PARTICIPATION IN RESEARCH STUDY

My name is Tlaba David Tlaba (Student Number: 200812639), a Masters student in the Department of Educational Psychology & Special Education of the University of the Zululand. I am requesting your permission to use your school to collect data on my proposed research. The topic is **"Anxiety associated with the use of technology among teachers in Lesotho."**

This is an invitation to seek your consent in collecting data for my study. The research will be conducted through the use of questionnaires and follow-up interviews. Your participation in this study is voluntary and you can decline to participate at any point. Responses could take a maximum of 30 minutes of your time (for completing the questionnaire and participating in the interview).

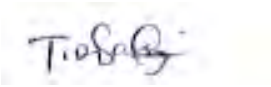
All information obtained during the course of this study will be treated strictly confidential. Data that may be reported in the research report or any journal will not include any information that identifies you as the participant.

Your participation in this study will contribute to existing literature on empowering teachers with Information, Communication and Technologies tools in Lesotho. The research report will be made available for viewing at your request.

Please advise me on possible dates when we could meet to complete the interview and fill out the questionnaire.

Your co-operation in this study will be appreciated.

Yours faithfully



Tlaba David Tlaba