Facilitating the self-efficacy of primary school teachers in Mpumalanga: A perspective from lifelong learning

by

YOLANDE LA COCK

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Declaration

I declare that this dissertation of limited scope, “Facilitating the self-efficacy of primary school teachers in Mpumalanga: A perspective from lifelong learning” represents my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Abstract

The aim of this research was to make recommendations on how to facilitate a healthy sense of Computer Self-Efficacy (CSE) in teachers of a primary school in South Africa. A literature study was conducted to determine a theoretical framework for the study. Thereafter a mixed method design was used to conduct an empirical investigation. This was done by means of focus group interviews, questionnaires and an observational narrative. The most important finding was that the teachers who participated in the research were professional and enlightened about the value of technology. They agreed that although daunted by the idea of technology it is essential for them to become proficient in the use of computers. The researcher came to the conclusion that the main obstacle that stands between the participants and technological proficiency was a weak sense of CSE. Recommendations were made on how one could use extrinsic motivation to introduce new technology in such a way as to enhance self-efficacy and as result computer self-efficacy.

Keywords

Computer Self-efficacy

Facilitation of CSE

Adult learning

Motivation

Attribution to success or failure

Professional development

TABLEOF CONTENTS

Chapter One: Introduction and overview

1.1 INTRODUCTION

A commitment to lifelong learning is the backbone of education in any society. To be a good teacher one must be able to remain a productive student.

One of the keystones of adult learning is a robust sense of self-efficacy (SE). SE, like beauty, is in the eye of the beholder. SE is, in essence, subjective in nature, because it is uniquely defined according to each person's frame of reference. SE does not refer to the capability of a person to perform certain tasks according to prescription, but rather to a person's belief as to his or her ability to perform certain tasks successfully. These beliefs govern people's thoughts, actions, behaviour and motivation in dealing with everyday life (Bandura 1994:71-81).

A person with a strong sense of SE believes that he or she is capable of bringing about change through the necessary levels of performance needed to complete tasks successfully. Adult learners with a healthy sense of SE attribute their levels of success in learning new skills to ability within themselves. Their locus of control is thus internal. According to Phelps and Ellis (2002:515-524), one's locus of control should be internal to be an effective member of society.

The learning environment has changed however, as the technological revolution developed a once limited communication grid, into a network so vast and efficient that it is difficult to grasp its capacity. Most adult learners are already in service and do not have the opportunity to give their time exclusively to studying (teachers are no exception). The most effective manner to study is therefore to make use of the extensive network established by Information Technology (IT).

In order to utilise IT to its full potential, one needs to have basic computer skills.

Computer literacy can be an advantageous skill when dealing with the challenges presented throughout the teaching profession. This skill is the cornerstone of a

healthy sense of computer self-efficacy (CSE). CSE, in turn, can contribute significantly to a robust SE.

One of the biggest administrative challenges faced by teachers is the challenge to master the technological devices available to them. They have to do this to help them to do their work efficiently. Many have the ability to use their computers (so for all practical definitions they are computer-literate), but they lack the self-confidence to fully utilise all the functions available.

One should distinguish between computer-literacy and CSE: Generally, being computer-literate refers to little more than having the ability to operate specific software programs like Microsoft Word, Outlook or social networks like Facebook. According to The American Heritage Dictionary of the English Language (2000), “someone is computer-literate when he or she has the ability to operate a computer and to understand the language used in working with a specific system or systems”.

CSE, however, refers to a person’s judgement of his or her capabilities to use computers in diverse situations. Research suggests that individuals, who possess a strong sense of CSE, are more likely to form positive perceptions of IT and use it more frequently. CSE is, therefore, more concerned with the level of comfort a person experiences when dealing with computers, than with his or her ability to use a computer. It can also have a great influence on the courage displayed by someone when exploring and utilising technological aides (Thatcher & Perrewé 2002:382).

Some of the teachers involved in this research have been in service for more than ten years and gained their qualifications before the digital revolution and its resources. However, it is this researcher’s experience that many of the older generation teachers have never been comfortable with the exploration of technology, even though they are computer-literate in some measure or another. By incorporating the use of computer software and online browsing as part of a comfortable work experience, one can support and nurture a sense of self-actualisation as well as SE.

By providing a positive computer experience to the participant-teachers, this study focused on developing the sources of SE defined by Bandura (1994:71-81), namely successful experiences, role modelling, positive experiences, as well as positive feedback and encouragement. These sources are also relevant when attempting to develop a healthy CSE.

1.1.1 Background and context of research problem

As early as 2003, the Department of Basic Education of South Africa realised the need for the implementation and utilisation of Information and Communication Technology (ICT). In the White Paper driving the transformation of learning and teaching, the developmental value of computer skills is recognised:

As in other spheres of social and economic development, ICT has improved the quality of education and training. It is for these reasons that Government has been quick to seize on the importance and practical benefits of ICT as a key for teaching and learning in the twenty-first century (Department of Basic Education 2003:6).

In their study on teachers' self-efficacy beliefs towards computers, Chifari, Ottaviano, D'Amico and Cardacci (2000:33-34) reported that the results revealed a high correlation between SE belief and computer experience. This study, done in the first world genre of education, showed that computer-phobia is not unique to South Africa; even in well-developed first world countries, researchers have found that teachers often show anxiety regarding the use of computers. They have concluded that this is a serious obstacle, when integrating computer-based technologies in the educational environment. The following passages will show that research confirms that there is a positive relationship between the quality of CSE experienced by teachers and their ability to use a computer effectively.

In McKenzie's article (2001:1-12), is a reminder that adults learn differently from children and that this has to be kept in mind when identifying approaches which will encourage teachers to learn new skills. "The true challenge of professional development is to inspire and prepare classroom teachers to launch these curriculum-rich activities with the tools that make sense".

In their article, *Constructivism: A paradigm for older learners*, Spigner-Littles and Anderson (1999:203-209) explained that, when teaching older adult learners new skills, one should firstly ensure that new information connects to, and builds on, prior knowledge. If this connection can be made, cognitive reconstruction and transformation can take place and the adult learners' understanding of the explored territory can enhance their quality of life and this in turn can lead to a more robust and healthy CSE.

One also tends to assume that the main obstacle preventing South African teachers from learning new computer skills is the availability of computers. However, according to McKenzie (2001:1-12), researchers found that even though teachers had free access to computers, the majority only utilised this technology for five hours a year and that was mostly during training sessions. It emerged that the training process was to blame. McKenzie found that most programmes were focused on business practice and not school. Teachers were rushed through a packed curriculum with insufficient guided practice. The answer lies in the fact that andragogy, or adult learning, can only be successful if the adult is part of the journey of personal growth and discovery. Spigner-Littles and Anderson (1999:203-209) support this conviction with the remark:

Our experiences have led us to conclude that older learners respond best to collaborative learning environments, in which the instructor and students provide and share information. In a collaborative setting, students are encouraged to actively participate and to openly share their own conceptualisations regarding solutions to the questions posed by the subject matter.

1.1.2 Relevance and importance of the research

These introductory remarks validate this researcher's decision to explore the possibilities of a learning environment where participant-teachers can experience a healthy sense of SE through learning new skills and assimilating these it into their frame of reference. These skills have the potential to be constructive tools towards personal development, while providing valuable input in curriculum planning for learners.

Woods, Karp, Miao and Perlman (2008:1-11), reasoned that teachers should be trained to be computer-literate to ensure the effective use of computers. They stated further that the challenges arising from the assessment of teachers' technological competencies should be addressed through the empathic understanding of these teachers' sense of CSE. They further stated that: "*An educator's technology implementation would be influenced by the availability of the technology and training received and the success or non-success of the implementation would mediate the educator's belief in his or her technology competency"* (Woods et al. 2008:1-11).

Many teachers in South Africa do not own a personal computer and this is a contributing factor to the country's high level of computer illiteracy. However, a letter distributed by The South African Democratic Teachers' Union (SADTU), informed South African teachers that the government had already adopted an initiative, in which they undertook to equip all teachers with laptops in April 2011:

Government now offers to pay in full (through Provincial Education Departments) on behalf of the teacher to the supplier and recover the loan (interest free) from the teacher over a five-year period. A recommendation was made that the Government should finally roll out the Teachers' Laptop Initiative (TLI) from 30 April 2011. The roll out of the project will be managed by the various Provincial Education Departments over a period of 3 to 5 years.… Indications are that all educators who qualify will receive a new official letter from the Provincial Education Departments, which will indicate the new reviewed funding model (SADTU 2011:1).

In order for teachers to stay up to date with changes in the learning programmes presented, they have to be able to use their computers efficiently. The Department of Basic Education tends to communicate changed curricula and assessment guidelines via its website and expects schools to upgrade to specifications and uphold established standards.

In 2012, The Department of Basic Education implemented a new policy, called The Curriculum and Assessment Policy Statement (CAPS).

The National Curriculum and Assessment Policy Statement is a single, comprehensive, and concise policy document, which will replace the current Subject and Learning Area Statements, Learning Programme Guidelines and Subject Assessment Guidelines for all the subjects listed in the National Curriculum Statement Grades R - 12 (Department of Basic Education 2013:1-2).

The CAPS syllabus sets out as a specified curriculum for each subject in order to prepare learners for a successful higher education experience. The Department of Basic Education committed themselves to ensure that the education system is properly prepared for CAPS. This approach included the development of educators at all levels of the system to ensure a common understanding of information provided (Department of Basic Education 2011:16).

Available resources to implement this new policy are mainly internet-based, and it is necessary for all teachers to be familiar with the workings of online browsing and research. Through the process of facilitating the development and growth of a robust and healthy CSE, participant-teachers can be empowered to accommodate these changes. Empowered teachers have the ability to develop learners into well-rounded citizens, who are able to play their part in a healthier economy by being employable.

1.2 PROBLEM STATEMENT AND RESEARCH QUESTIONS

Teachers who are well educated and up to date with developments in society are assets to the effective management of society as a whole.

Sustainable growth and development are buzzwords in many strategies to strengthen South Africa's economic circumstances. The fact of the matter is that there are many opportunities for people to grow and develop, but it is also true that many of the candidates employed in key positions are not capable of doing the jobs they are supposed to do. This researcher feels that the true solution in the sustainable creation of jobs lies in effective education for all. In order to accommodate the large contingent of young people to be trained, teachers will have to be able to utilise the opportunities provided by e-learning. This can only be done if

teachers have a robust and healthy sense of CSE and are capable of making use of the digital resources provided.

In his drive to promote e-learning in schools, Kobus van Wyk, an influential promoter of digital learning, stressed on his Science and Technology blog, that ICT can be a valuable and productive tool in the hands of teachers, when used skilfully. He warned, however, that one of the critical success factors in the implementation of e-technology in schools is the competence of teachers regarding the use of computers as a teaching and a learning tool. This is why the technology training of teachers must form an essential part of plans for the implementation of technology in schools (Van Wyk 2011:14-17).

It is of paramount importance that teachers in this country should be empowered to use computers as a resource and not only see it as an outlandish but necessary tool in order for South Africa to prepare for this digital revolution.

In 2010, this researcher was tasked with an action research study to find ways to enhance the job satisfaction of a group of teachers at a primary school in the Mpumalanga province of South Africa. This pilot study revealed that many teachers do not have a healthy sense of CSE, mostly because of insufficient computer skills. These shortcomings led to teachers being frustrated and harbouring feelings of inadequacy.

It became clear in the research done during the above-mentioned study on teachers' job satisfaction, that most teachers felt extremely overwhelmed by the intricacies of modern technology, especially computers. Instead of embracing computers as an effective tool, this technological aide generated stress rather than comfort. In the process of investigating this problem, it was found that the best way to plan and execute computer training for teachers was to determine and understand what they need.

Although MS Word, Excel and PowerPoint were included in their curricula, more than fifty percent of these teachers felt that the computer programs were not presented as

relevant to their teaching lives. However, nearly eighty percent of participants recognised the need for relevant, teacher-orientated software training.

This researcher has found, through observations as well as the pilot studies, that teachers are, as a rule, very knowledgeable about their needs and are not afraid to define these. The reason for this is that they truly believe that they can make a difference to learners' lives. Another firm belief is that the learners' education is paramount and if it means that the teachers will have to conquer their fears and address new challenges, they will do so.

Lessing and De Witt (2007:53-67) highlighted the fact that professional development of teachers will only be effective if participants consider it to be useful and worthwhile. These authors determined that skills development workshops should be properly planned to address the specific needs of the teachers concerned. These workshops should also accommodate all the levels of expertise represented in the workshop. These efforts should contribute to developing a positive belief of CSE and so result in the general improvement of education. After interviewing several colleagues on an informal basis, it became clear that many teachers, although having access to a laptop or desktop computer, did not have the knowledge, which would enable them to utilise this technology. As indicated by Bandura (1994:71-81), adults prefer to learn new skills through mentoring. One can therefore assume that teachers would prefer to learn about computers through observing skilled colleagues and through regular meetings on an informal basis. This can be done to increase and implement teachers' computer skills and to help each other with their computer problems. For the pilot study, the researcher therefore concluded that an introduction to a basic software program in a practical, but relaxed fashion is what they need to improve their working conditions.

A tutorial on Microsoft Office Word was downloaded from the Microsoft website. This learning programme included all the basic features and functions, which one could use in a word processing program. Even though it was directed at novices, it contained very useful tips and suggestions, even for those who were more comfortable with their computers.

The participating teachers responded positively and commented that their workload was eased and that they felt more independent, because they were then able to type their own work. They felt competent, and could perform intricate timesaving tasks. They were able to produce a higher standard of work, because they had access to online encyclopaedias. On a personal level, their administration work was far more organised and they were able to make account payments online. During a quick survey aimed to determine if all aspects of the tutorial had been understood, a big majority indicated that they were able to use all relevant functions.

After completing the tutorial, one of the teachers summed up the experience as follows: "This tutorial helped me to work more effectively and makes my life much more comfortable because it saves time and gives me independence. I feel competent, organised and realise that I am actually knowledgeable!" This indicated how being computer-literate improved her beliefs of CSE.

Bandura (1994:71-81) warns, however, that, even though middle-aged people wish to settle in their established routines and are stabilised in their sense of SE as far as skills development is concerned, this self-confidence could prove to be an insecure one. Rapid technological changes and development force all active employees to require the necessary skills to cope. Through the questionnaires and interviews during the pilot studies, the students mentioned that, although computer training was part of their learning programme at university, they use outside sources to help them master computers. This is only successful however, because they have a vested interest in attaining computer skills. Brown, Czernieiwcz and Pedersen (2008:1-4) confirm this observation with the words: "However, even with this small amount of experience, 30% of these students also indicated that they are self-taught, which suggests a high interest and self-efficacy with regards to computers".

The older generation teachers could face daunting challenges when competing with younger teachers for promotions or even employment. School governing bodies sometimes employ younger teachers because they seem to be a better long-term investment. However, a teaching corps mostly consisting of well qualified, but inexperienced younger teachers, does not augur well for their ability to deal with the challenges presented by a diverse and multi-cultural youth. The experienced, older

teachers will be invaluable when younger teachers have to be trained to cope with young people, whose robust sense of exploration and occasional disregard for discipline can be disconcerting. Teachers have to move with the times and keep up with software development in order to be functional and effective. The Draft White Paper drawn up by the Department of Basic Education (2003:26) stressed the need for a computer-literate teaching generation to facilitate curriculum changes and management decisions as effectively as possible:

In order to increase administrative efficiency through the use of computerised information systems, the Department will develop standardised templates for management, statistical analysis, record keeping and reporting (Department of Basic Education 2003:26).

The purpose of this research can therefore be seen as emancipatory in that it creates an opportunity for teachers of a primary school to be empowered by building up their sense of CSE through the introduction of technology as an aide to the teaching process.

The main research question for this study therefore is:

How can a robust sense of CSE in teachers be developed in a South African primary school?

Following from the main question, and to get a better understanding of the situation, the following sub-questions were addressed:

What is the present state of teachers' CSE in a South African primary school in Mpumalanga?

What computer technology skills do primary school teachers have?

How can computer skills be cultivated so that these may enhance teachers' CSE?

1.3 AIM OF THE RESEARCH

The main aim of the research is to identify measures on how to design a mechanism, which can be employed to develop a healthy sense of CSE in a South African primary school. The need to facilitate a healthy sense of CSE in teachers is urgent when considering the vital assistance that e-learning can provide to teachers who are situated in remote areas of South Africa. Following from the main aim, the secondary aims are to discover the present state of CSE among teachers of South African primary school and to understand these teachers' needs regarding the use of computer technology. By clarifying this, teachers' professional lives can be improved and education as a whole can be enhanced.

As preparation, the researcher made a thorough study of Bandura's SE construct (1989), featured in his social cognitive theory, Maslow's motivational theory (1943), Weiner's attribution theory (1985) and Knowles' theory of andragogy (1980). This was done to clarify and truly understand what these theories entail and how they relate to the educational environment. After this, the role of technology in the learning theories was also to be explored. The situation was then qualitatively researched in order to investigate how the CSE of teachers can be improved.

Professor Kader Asmal (2003:4), then Minister of Education, mentioned in the foreword to the Draft White Paper on e- learning that the introduction of ICT to South African schools would create new possibilities for learners and teachers to engage in innovative ways of information selection, gathering, sorting and analysis. He added that ICT has the potential to enhance the management and administrative capacity of schools.

By having the ability to utilise a word processing program, as well as a calculation spread sheet, teachers will be able to apply specific information in various ways and so fulfil the administrative documentation required by the Department of Basic Education. This should minimise stress and emotional imbalance, which in turn will improve the development of a positive CSE.

1.4 DEFINITIONS OF TERMS IN THE CONTEXT OF THIS STUDY

In order to establish a common frame of reference concerning this specific research topic, the concepts used are now defined. It is essential that aspects relevant to this specific research are determined beforehand.

1.4.1 Social cognition

Social cognitive theorists like Bandura (1989:1-60), entertain a school of thought, where the researcher wishes to understand the way in which people learn and use their intelligence or capacity to understand. This use of intelligence is called "cognition". These theorists also tend to study the interaction that this concept has with our social development and experiences. This interaction refers to the "social" part of social cognition. This approach believes that individuals learn through observing other individuals' social interactions and experiences. Social cognition can therefore be defined as the manner in which people assimilate certain behavioural patterns. The factors influencing behaviour are *the environment* and *the situation*. The *environment* consists of the social environment – family, friends and colleagues and the physical environment - workplace, health and physical well-being. The *situation* is an individual's perception of the environment experienced. The environment and situation provide the framework for understanding people's behaviour (Bandura 1989:1-60).

Social cognition takes place through observing other individuals' social connections and experiences. O'Sullivan and Strauser (2009:251-258) reasoned that for this reason one can assume that observational learning takes place when individuals absorb certain behavioural patterns by observing the actions and behaviour of other individuals. Observational learning is governed by four mental sub-functions. The first is attention – people will only implement behaviour that is noticeable to them. The second is retention –one cannot adopt behavioural patterns if these cannot be remembered. The third is concept-matching – this is the level of compatibility where certain behavioural patterns of others can be understood in terms of one's own frame of reference. The fourth has to do with the motivational processes of an individual – one will only learn behaviour that has meaning or value or improve one's

circumstances (O'Sullivan & Strauser 2009:251-258; Bandura 1982:122-147; Bandura 1994:71-81& Bandura 1989:1-60). A core construct in the social cognitive theory is SE.

1.4.2 Self-efficacy (SE)

According to Bandura (1994:71-81), general SE can be described as a person's confidence in his or her ability to perform a wide range of actions, as well as to overcome various challenges successfully. Domain-specific SE is a person's confidence in his or her ability to perform a specific task or meet a specific challenge. For example, if one believes that one can successfully master computer software, one experiences a healthy CSE (SE related to computers).

Efficacy expectations are expectations that the individual has, to be able to execute actions successfully in order to produce the desired outcomes. The focus of the study includes the following factors: successful experiences, positive emotions, positive feedback and encouragement, as well as role modelling (Bandura 1994:71-81).

The psychological processes involved in the development of a positive perception of SE include cognitive, motivational, affective and selection processes (Bandura 1994:71-81). Cognitive processes involve *the successful experience* of acquiring new information and knowledge, organising this information and applying it effectively to daily practice in order to improve working conditions. Motivational processes help people set positive goals for themselves, creating the expectation to succeed. Through social persuasion and tutoring by colleagues, the *positive emotions* evoked by meeting challenges and reaching goals can thus be experienced.

O'Sullivan and Strauser (2009:251-258) cited Bandura, explaining that affective processes are guided by *positive feedback and encouragement* which represent a good defence against stress and depression experienced when one is faced with challenges present in one's working life. People tend to select environments that are beneficial to beliefs of SE and to take control over the actions that they choose to

perform and the challenges that they wish to accept. *Role modelling* creates a supportive environment, in which people can relax and learn through observation.

1.4.3 Computer self-efficacy (CSE)

CSE can be described as one's beliefs in one's capability to master the logic of computer software on a cognitive level and the expectation that one will be able to execute the actions necessary in utilising the computer as an educational tool through effective behaviour. The anxiety born from low computer competence can override the perceived importance and considerable value that computers may have in the life of a teacher, thus creating an affective difficulty. This in turn will limit the selection processes to actions that exclude the use of computers and therefore limit the efficacy expectancy of teachers (Chifari et al. 2000:33-34). If a successful training programme can be initiated, the participant-teachers will be able to acquire new information and use this to be more effective in their jobs. In experiencing the positive emotions that can be generated by a healthy sense of CSE in their working lives, teachers should be motivated to put more effort into mastering their computers and not dismiss the lack of efficiency as a lack of ability.

Disturbing thought patterns, like anxiety and fear, will be replaced by self-confidence when computers are used regularly. This research intends to find a way to guide these teachers in creating an inner locus of control within themselves, by being able to determine their own goals and reach expected outcomes. This will help them remain task-orientated while practising skills involved and applying knowledge gained (O'Sullivan & Strauser 2009:251-258; Bandura 1994:71-81& Bandura 1989:1-60). In order to determine measures, which can be applied to facilitate a more robust CSE, the researcher decided to concentrate mainly on the qualitative research design. This type of design is appropriate when one wants to find out about the way people experience life and its challenges.

1.5 RESEARCH METHODOLOGY

A qualitative research design was primarily implemented to do this research study. Qualitative research places the researcher as observer in the world of the

participants. It places value on studying human experiences and providing a clarification of issues in a specific background (Tierney 2008:1). Qualitative data can be collected by asking questions (using interviews and focus groups), or observing aspects first-hand. An open-ended questionnaire was used to collect data. This questionnaire concluded with a number of Likert items. This was done to focus the respondents' reactions; the survey repeated the essence of the open-ended questions, but allowed only specified answers. The respondents had to choose the answer closest to their point of view. If these answers were congruent with the answers given in the open-ended questionnaire, this allowed for a certain amount of triangulation. The application of the Likert scale items classified this study as a mixed-methods one. Ethical considerations are also discussed in this section.

1.5.1 Research design

The qualitative research design helps the researcher understand the participants' natural environment and can thus become part of their frame of reference and the values that they attribute to their experiences. The development and use of mixed-method designs are often employed as researchers realise that it is sometimes more effective to use both qualitative and quantitative methods in the same study (McMillan & Schumacher 2006:401). This research was done by predominantly using qualitative research design methods, but the inclusion of a brief survey moved the researcher to redefine this research as a mixed-method design.

1.5.1.1 Research paradigm

Social analysts refer to one's frame of reference as one's point of view, which is determined by culture, norms, understanding, beliefs and worldviews. The research paradigm is like the frame of reference of the research (De Vos et al. 2005:261-262). A research paradigm directs the selection of the research design and strategy, as well as regulates the problem formulation, actions, findings and conclusions. Educational research is mainly concerned with understanding and discovering highly individualised social phenomena. Most educational questions originate from personal realities, which in turn are very subjective. A non-positivistic paradigm was therefore

chosen to address questions concerning motivation, self-efficacy and the way in which one learns (Dash 2005: 1-6).

Non-positivism is an approach that emphasises the fact that reality is defined by knowledge gained through personal experience, rather than from accepting sources outside an individual. Non-positivists believe that peoples' realities are multi-layered and can only be truly understood after a probing qualitative research. There are three schools of thought in Non-positivism that are concerned with humans' interactions and experiences, namely Phenomenology, Ethnomethodology and Symbolic interaction (Dash 2005:1-6).

Phenomenology states that human beings attach meaning to subjects, ideas and actions based on their interaction and experiences with these constructs or meanings. In order to incorporate facts based on her understanding of the motives behind the actions of the participants, the researcher should develop an empathetic understanding of the participants' interpretation of their experiences. Ethnomethodology is concerned with the process in which reality is constructed. This includes the manner in which people make sense of social settings and work-related challenges. Symbolic interaction is the way in which human beings allocate value to certain experiences and how this can influence and develop societies (Dash 2005:1-6).

For this study, Social Cognitive Theory (SCT) and Self-Efficacy Theory (SET) are the lenses through which the data is collected, analysed and interpreted. SE is a core construct in SCT defined by Albert Bandura in 1994. CSE is about the perception that an individual has of his or her ability to master computer software. A well-developed sense of CSE refers to a high level of confidence, which is experienced towards the utilisation of computer software in everyday life.

1.5.1.2 Research approach

Qualitative research designs gathers data on naturally occurring phenomena. This data is in the form of words rather than numbers. Through this approach, the researcher can attain a deeper understanding of the occurrences or events that are

experienced by all stakeholders (McMillan & Schumacher 2006:26).The inclusion of the survey to help triangulate the answers given in the open-ended questionnaire led to a mixed-method approach, because quantitative methods were also utilised to come to the conclusions reached. This type of mixed method design is called the exploratory design by McMillan and Schumacher (2006:403). They stated that there are two different approaches to the exploratory design. The emphasis could be more on the qualitative design and the quantitative methods are used to confirm, determine or expand on the qualitative findings – ("QUAL → quant"). The second emphasis is more on the quantitative design if the main purpose is to test out a research instrument – ("Qual → QUANT"). This researcher chose the former of the two.

Qualitative research concentrates on the meaning that people attach to their experiences and the emotions generated by these incidents. Qualitative research results are significant, because researchers are allowed to be flexible in problem conceptualisation and data collection. The fact that this design serves as a guide rather than a set of rules demands excellence from the researcher (Newby 2010:115).

Qualitative research is concerned with life as it is lived and as few assumptions possible should be made in advance. The researcher chose a qualitative interactive research design, because this type of design has life as its main source of data. This research design focuses on the individuals' experiences of life, as well as the challenges experienced in their working lives. This researcher wished to understand these real experiences of the participants and to do this she needed to be involved in their lives. The research was carried out at a school in Mpumalanga and the sampling was done on a convenience basis, as these teachers were available and willing to participate in the venture.

1.5.2 Research methods

1.5.2.1 Sampling procedure

Two focus groups, consisting of six teachers each were interviewed (see tables 4.1 and 4.2). The criteria concentrated on computer experience and teaching experience and on how different age groups experience CSE in the work situation.

A questionnaire was distributed to all the teachers on the staff. Of the forty possible respondents, thirty-four returned the completed documents.

One teacher's life and experiences were studied and presented as an observational narrative.

In order to understand the issue of CSE and how this may affect general SE as well as influence the group and their effectiveness as teachers, an observational narrative can provide information on typical reactions and common fears that may exist as a result of being confronted with technological changes (Newby 2010:253-255).

1.5.2.2 Data collection

Data collection and analysis may occur simultaneously, because qualitative research is not a linear process, but rather an emerging process developing understanding. The evidence and data explaining the phenomenon of CSE of teachers were gathered through the in-depth interviewing of focus groups. A questionnaire was distributed to all the teachers on the staff with questions that arose from the focus group interviews.

According to Newby (2010:51-54), a case study is a study of an individual situation. A case study can be selected as representative of a larger group, because it would be typical of this group. This instrumental observational narrative about a particular participant is a limited type of case study based on observation and informal interviews. This instrument was chosen to gain a better understanding of the issue of CSE and to determine how CSE

influences general SE (De Vos et al. 2005:272). Methods used included a review of the relevant literature, observation, focus group interviews and questionnaires with open-ended items and a survey included.

1.5.2.3 Data analysis

Data analysis is done by reorganising the information collected in such a way, that patterns can be discerned. To prevent wrong conclusions about data analysed, one should triangulate facts and estimations of reality with other sources (McMillan & Schumacher 2006:374). For example, it would be necessary to corroborate observations with participant confirmation. If information is trustworthy, one can start with coding or naming units of data. This coding is done throughout qualitative research, because a pattern detected can lead to insights not previously considered. According to Newby (2010:453-474), one has to follow certain steps to make coding work. First, one should record all relevant information when data is collected - when, where and who. Following this, one should study a range of the data collected before coding this specific batch gathered. This identifies the scope of data collected, and new insights and patterns may occur to the researcher. This was done through the transcription and analysis of the focus interviews. After this, the questionnaires were analysed to form a comprehensive overview of the data collected. The observational narrative has its origin in the researcher having first-hand and intimate knowledge of the fears and personal victories of one of the participant-teachers. Then the researcher should think about what she would like the data to accomplish – is there a need for descriptions or interpretations? Coding using the Interpersonal-process code (IPC) transformed data into information. Finally links and themes were identified which generated findings, which lead to conclusions. Before themes could be identified, an extensive literature review was compiled to understand the significance of findings.

1.5.2.4 Trustworthiness

According to Newby (2010:121), the dimensions to ensure trustworthiness in qualitative research are credibility, dependability, confirmability and transferability. Credibility is ensured when the participants and end-users in the research agree that

the data collected is believable from their perspective. Dependability can be established if the background of the research is explained in a manner that it is sufficient to convince the audience that the conclusions reached through the study are reliable and correct. Confirmability is the assumption that when subsequent studies are done on the same issues, similar conclusions will be reached. Transferability is the burden of demonstrating the applicability of one set of findings to another context (De Vos, Strydom, Fouché & Delport 2005: 345-347). Through these dimensions, validity is confirmed. Validity refers to the congruence between the findings and reality of the world (Macmillan & Schumacher 2006:324). Validity has been ensured through verbatim accounts and detailed descriptions of participants and their situation and participant researchers.

During this research, credibility was established through ongoing observation and feedback from the participants to ensure that a true understanding of their point of view was presented. The researcher was a participant researcher. This fact ensured that the context of the research was portrayed accurately. Because this is mainly a qualitative study, there were no statistical objective measurements like the ones presented in quantitative research. Confirmability can only be ensured if the personal frame of reference of all participants, including the researcher is illustrated adequately. It is also necessary for enough information to be gathered in order to provide a complete scenario. This is further explained in Chapter 3. According to De Vos et al. (2005:246), the researcher can accommodate later studies by providing as much information as possible. Even though it is important to understand the context and frame of reference as thoroughly as possible, it is essential that the welfare of the participants should always be considered. Ethical measures should therefore be put in place to ensure this is done.

1.5.3 Ethical considerations

In order to ensure that research was done in an ethical manner, informed consent was requested from school management as well as individual participants. Confidentiality and anonymity were ensured by protecting the identity of individuals (McMillan & Schumacher 2006:334). This was done by ensuring complete anonymity. No names appeared on the questionnaires and the focus group

participants were identified by codes rather than names. The observational narrative included no identifiable facts or characteristics. The ultimate goal of this research was to enhance the lives of the teachers involved and not to harm them in any manner. A detailed discussion of this issue is presented in Chapter 3.

1.6 DEMARCATION OF STUDY INTO CHAPTERS

The research consists of five chapters and these are discussed below.

Chapter 1 provides the background, rationale, and aims of the study. The research question, paradigmatic perspectives as well as the research design, methodology and intended analysis are explained. A brief clarification of concepts is given.

Chapter 2 provides a theoretical framework created through a literature review concerning the research. It is an assembly of the literature pertinent to the research topic. This review connects the research with a wider database creating a context in which others can evaluate the findings and the conclusions generated. Topics discussed include the essence of CSE and how it is placed in the educational landscape; and the implications that the lack of computer skills has for the professional development in education; how a robust feeling CSE of primary school teachers can be facilitated; how adults learn and what motivates teachers to become self-actualised individuals. The researcher also studies the areas of research in CSE that can be explored further.

Chapter 3 describes the research methodology. The researcher focuses on explaining the mixed method research design and data collection methods as well as methods of data analysis.

Chapter 4 consists of data presentation, data-analysis and a discussion of the results. The findings of the research are presented and interpreted in the light of the conceptual framework of the study, namely SCT, SE and CSE in particular.

Chapter 5 consists of a summary of the literature review, the empirical study, the conclusions and recommendations. The limitations of the study are pointed out. Recommendations for improving the CSE of teachers and the possibilities for further study are explored.

1.7 CONCLUSION

In this chapter, the concept of CSE was introduced, a background was provided and the justification for the study was explained. The pilot study, done to establish the need for a robust CSE amongst teachers, showed an astounding eighty percent of teachers who, even though they had previous training, revealed a need for personalised and practical teacher-orientated computer training. An overview of the planned research was provided and the paradigmatic perspective was defined.

In Chapter 2, the more extensive literature review explains the need for finding a practical and teacher-directed method to enhance and introduce a healthy sense of CSE amongst educators.

Chapter Two: Literature review

2.1 INTRODUCTION

SE and especially CSE have already played and will continue to play an important role in the establishment of life-long learning. Without computer literacy as a listed skill in their repertoire, many students and teachers will miss the magnificent fountain of knowledge and information available on the World Wide Web.

The aim of this research has been to find methods to accommodate a healthy and strong sense of CSE in a group of teachers in a primary school in Mpumalanga (see section 1.3). In order to do this, the researcher did a literature study to understand the underlying components from which CSE originated.

This chapter endeavours to provide a theoretical base for this research on CSE, as well as to determine the need for this study and its place in this knowledge base. A theory base for the research is therefore established. Finally, the importance of technology in the lives of educators is discussed, and how this can influence their attitudes towards lifelong learning is explained.

2.2 THEORETICAL FRAMEWORK

The theory base of research explains why something is the way it is or why people react in a specific manner. According to Merriam Webster, a theory is an idea or set of ideas that is intended to explain facts or events. It can be an idea that is suggested or presented as possibly true, but that is not known or proven to be true. A theory also provides the general principles or ideas that relate to a particular subject. A theory is a belief, policy, or procedure proposed or followed as the basis of action (Merriam Webster.com 2014).

In order to establish and motivate the theory base of this research, the researcher had to review various theories to determine where this specific research would fit in. To do this, the roles of Bandura's construct of SE, Maslow's motivational hierarchy, Weiner's attribution theory and Knowles' theory of andragogy are discussed. This

theory base creates a background for the essence of adult learning and motivation and explains how these influence SE and therefore also CSE. The learning theories on Information Processing and Constructivism provide the “lens” for the interpretation of the empirical data collected and give a perspective on the role of technology in teaching.

2.2.1 Bandura’s construct of self-efficacy

2.2.1.1 Introduction

Alfred Bandura introduced the construct of SE as an important part of his Social Cognitive theory. He claimed that perceived SE could be defined as people’s beliefs about their competence to produce the necessary levels of performance, which will then be regarded as successful. SE beliefs determine how people feel, think and motivate themselves and how they behave under difficult circumstances (Bandura 1994:1).

A strong sense of SE enhances people’s lives in terms of their accomplishments and general well-being. People, who experience a strong sense of SE, regard difficult tasks as challenges rather than threats to be avoided. They set high goals for themselves and remain dedicated to obtain to these goals successfully. If they fail, they see these failures as part of the development process and not due to their lack of ability. They have the capacity to realise when they have to increase their effort and knowledge base. Based on Bandura’s description (1994:1-8) of a person with a robust sense of SE, one can assume that a healthy sense of SE could be a huge asset to anyone’s personal arsenal against the stresses if life.

However, the opposite can be said for people with a weak sense of SE. The lack of SE does not just cause the lack of ambition; it can cripple a person emotionally limiting that person to depression and low expectations. It is consequently very beneficial to develop and nurture a robust sense of SE (Bandura 1994:1-8).

According to O’Sullivan and Strauser (2008:251-258), SE draws on both cognitive and behavioural components. These are based on the principle that cognitive

processes can mediate behavioural change, but that cognitive events can be altered and brought to life through mastery experiences, which in turn develops from effective performance.

2.2.1.2 Sources of SE

According to Bandura (1994:3-4), there are four main ways to develop a healthy sense of SE: *Mastery experiences, vicarious experiences, social persuasion and emotional arousal*.

The researcher has experienced that the most effective way to develop a healthy sense of SE is through *personal mastery*, as this boosts morale and motivate one to try even harder and address prospects that are even more challenging. Success builds up SE, while failure undermines it. If one only experiences easy successes one's SE is not developed to endure failures. Resilience can only be developed if obstacles are overcome on a regular basis. Success requires sustained effort (Bandura 1994:3-4).

Social models provide *vicarious experiences* illustrating to the observer that success can be achieved by people in similar circumstances like himself/herself. The effectiveness of modelling is greatly influenced by the perceived similarities between the observer and the model – the greater the similarity, the more persuasive the possibility of enhanced SE (Bandura 1994:3-4).

Social persuasion is a third way to convince people that they have the ability to succeed in their endeavours. Verbal persuasion by a mentor, who believes that one has the capabilities to succeed, can move a person to try harder (Bandura 1994:3-4). However, if this belief of personal efficacy turns out to be false, it can demotivate a person to such an extent that his or her belief in SE is weakened in the process rather that strengthened. Ironically, people can be very easily persuaded that they lack the capability to complete a certain task.

Finally, *emotional arousal* provides a positive experience concerning the new skill acquired. People are regulated by their emotional states and moods in judging

whether they can accomplish something or not. A positive mood enhances SE while a depressed state of mind weakens the sense of SE.

2.2.1.3 Efficacy-Activated processes

According to O'Sullivan and Strauser (2008:252), one of the central concepts of the construct SE is efficacy expectation – which can be explained as a person's conviction that he or she will be able to succeed in reaching a specified outcome. In contrast to this expectation is the outcomes expectation, which can be defined as a person's belief that by following a certain procedure one can expect to produce a specific and desired outcome. The interaction between these two kinds of expectations influences an individual's behaviour.

Bandura (1994:4) explained that there are four major processes through which SE can influence human functioning: *the cognitive processes; the self-regulation of motivation; the affective processes;* and *the selection processes*.

Firstly, there is the *cognitive process*–Bandura (1994:4) explained that if one can imagine something, one can do it. People with a strong sense of SE tend to set higher goals for themselves. This researcher believes that such people have faith in themselves intellectually that they may succeed and therefore the attempt much more complex tasks than those with a weaker sense of SE do.

Secondly, the sense of SE plays a key role in people's *self-regulation of motivation*. There are three different forms of cognitive motivators influencing SE. They include causal attributions, outcomes expectations and cognised goals. People with a high sense of SE believe that challenges occur during task completion because they must try harder or learn better skills. People with a weak SE give the reason for poor performance as being outside of their control, for example that they fail because of low ability – even if they try harder, they will still not be able to succeed. Outcomes expectancies are the expectation that people have that certain actions will bring about specific outcomes. If one believes that one will succeed by performing certain actions, one will be motivated to try harder. Bandura (1994:4) added that cognised

goals are challenges, which provides a major cognitive mechanism for motivation to try even harder at difficult tasks.

O'Sullivan and Strauser (2008:252) cited Bandura (1994:3-8) where he stated that the *affective process* is the third process of human functioning influenced by SE. People with high SE are motivated to set challenging goals for themselves and being committed to the successful completion of a task. People's beliefs in their coping capabilities affect how much stress and depression they experience in difficult situations. A person with a robust sense of SE can effectively reduce anxiety in difficult situations because he or she believes that he will be able to cope with stress and control his emotions if threatened.

O'Sullivan and Strauser (2008:252) also cited Bandura (1994:3-8) where he explained that the final process is the *selection process* where people with a strong sense of SE have the ability to create a beneficial environment and to exercise some control over those with whom they spend time. If one surrounds oneself with successful people, one will also experience success in one's life.

In their explanation of efficacy expectations, O'Sullivan and Strauser (2008:252) identified three efficacy dimensions namely *magnitude, generality* and *strength*. *Magnitude* is concerned with the complexity and the difficulty of a certain task. The *generality* has to do with the extent to which expectations will influence the performance and outcomes of specified tasks and the *strength* has to do with the effort that an individual is prepared to put into reaching these outcomes. In other words, the owner of a healthy SE would not shy away from a difficult task if he or she knows that certain actions will lead to the desired outcomes as long as he or she has put in the necessary effort needed to succeed.

The researcher concludes that perceived SE is about people's beliefs in their ability to control how they function in life and how they deal with stressful situations and events that cross their paths. A strong sense of SE can enhance people's levels of motivation, choices in life, quality of life and resilience against adversity. As this is all about perception, it can be developed and strengthened as part of an effective personal development plan motivated by the commitment to excellence.

O'Sullivan and Strauser (2008:252) warned that efficacy expectations alone would not produce the desired outcomes, if an individual were not motivated to engage in the actions necessary to reach the specified outcomes. Even though a person may have the skills to perform a certain task, the motive to do so may be lacking due to various factors. Factors, which determine motivation, are discussed in considering Maslow's motivational theory.

2.2.2 Maslow's motivational theory

The premise of Maslow's motivational theory (Maslow 1943:370-396) is that people are motivated by their needs; these needs are *physiological* (basic primary needs) as well as *psychological* (higher order needs). These *basic needs* are the needs to satisfy hunger and thirst and to have enough rest, followed by the need to feel safe and secure.

Poston (2009:347) claimed that Maslow's hierarchy of needs is a valuable assessment tool, which can be used in especially the field of education amongst others. He confirmed that a person resolves his or her most basic needs for survival first, before moving on to needs that are more complex. Here follows a pyramid graph of the needs as determined by Maslow (1943:370-396).

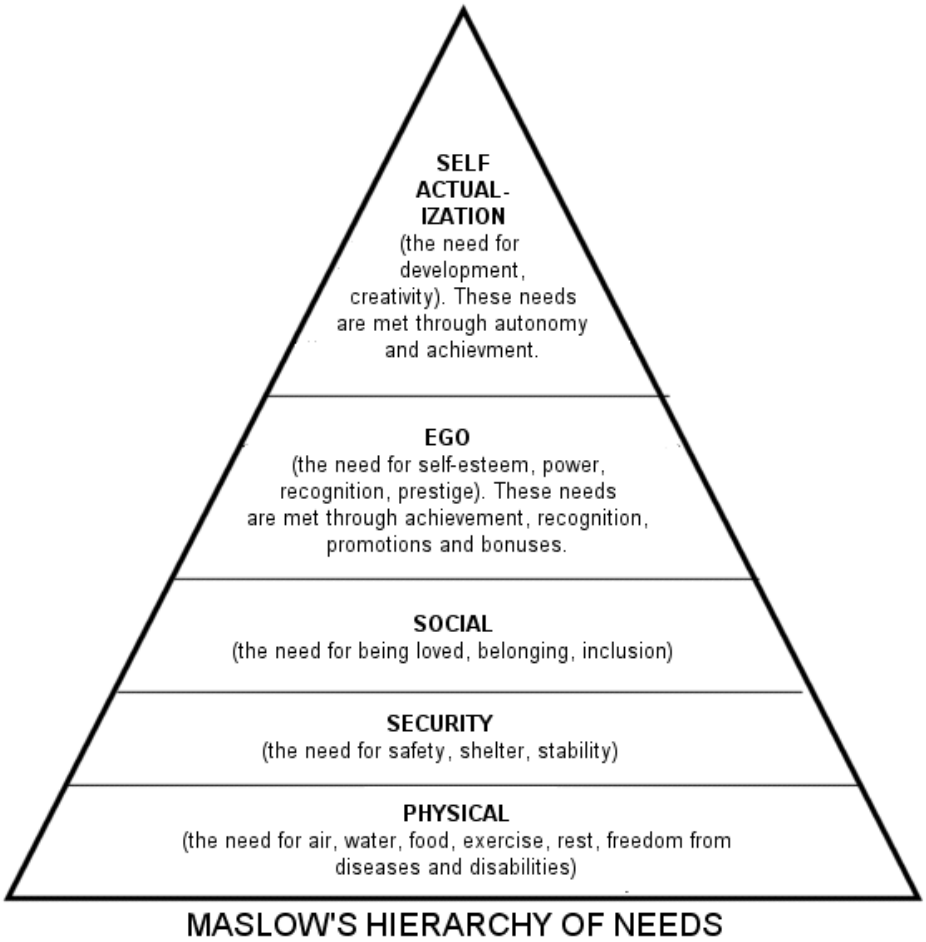

Figure 2.1: Maslow's hierarchy of needs (McLeod 2013)

Poston (2009:348) explains that, when an individual does not have enough of something, he or she has a deficit and therefore experiences "deficit needs". Deficit needs make up the four lower levels of Maslow's hierarchy. When deficit needs are met, they are temporarily satisfied and must be addressed if they are found to be lacking again. On the other hand Maslow, according to Poston (2009:348), entertains the idea of "being needs". Being needs are internally motivated and separate from the deficit needs in that they have to do with spiritual enlightenment, personal development and self-actualisation.

O'Connor and Yballe (2007:739) cited Maslow in their article on a revalidation of Maslow's hierarchy of needs as confirming an integrated process, where basic needs can simultaneously be satisfied at one single moment and that the satisfaction of one need is not a prerequisite for all others to be met. However, if the basic needs

have been met, there will still be an emptiness in people's lives that can only be filled by addressing the higher order needs of *affiliation* (being with others like oneself), *appreciation* (receiving recognition for one's accomplishments from one's peers) and *self-actualisation* (reaching one's full potential) (Maslow 1943: 370-396). O'Connor and Yballe (2007:741) further noted that Maslow understood that there is a very fluid emergence and combination of needs and activity on a day-to-day basis. They repeated that Maslow was clear in his opinion that human beings should therefore be studied as integrated whole organisms.

Poston (2009:349) confirms that although physical needs remain consistent throughout life as essential, safety needs can differ from individual to individual. Adults' safety needs may be economic in nature or job security. Only when the two bottom needs are met can the individual experience stability in life. The social level can then become a priority and a person becomes more intent on building social relationships with others (Poston 2009:350).

The researcher believes that an adult needs to affiliate with people who are successful at doing their jobs. This association will put them in the same category as effective workers and so fulfil the safety needs of both job security as well as the belonging needs of being accepted. In order to achieve this affiliation and association the adults will be motivated to learn new skills, for example technological skills. Their perception of their capability to learn new technological skills is greatly influenced by their sense of CSE. A healthy sense of CSE is therefore essential to meet the basic deficit needs – one of which is the need to maintain self-esteem.

Poston (2009:351) explains that esteem needs are on the highest platform of the deficit needs and must be met on two levels: The lower level is related to a person's ego, meaning that there is a strong need to be respected by others, for example, if one has to put effort in to maintain a required status or reputation. This level usually needs some kind of extrinsic reinforcement and validation to be met and stabilised. The higher level is that of self-respect. People on the higher part of self-esteem have confidence in themselves and like who they are. Maslow contended that most people with psychological challenges have low self-esteem and that this creates a barrier to achieving personal success. The researcher feels that a healthier sense of CSE can

be beneficial in improving general self-esteem perceptions. This improvement may motivate participants to aim for even more challenging cognised goals.

According to Ryan and Deci (2000:54-55), there are two major distinctions regarding the motivation of people - intrinsic and extrinsic motivation. Intrinsic motivation refers to doing something because it is inherently agreeable and fascinating. The second type of motivation is extrinsic motivation – when one does something because it leads to an independent outcome. According to the researchers, Ryan and Deci (2000:60), extrinsic motivation can vary greatly in the way that it is self-governing. This researcher can concur that very few people learn something nowadays for the sheer pleasure of knowing it. People learn new skills because their professional lives demand it. They sometimes have no choice in the matter, because if they do not conform they will be left behind or overlooked for promotion. If one learns a certain skill in order to streamline one's working experience, one could argue that this is done through extrinsic motivation. The secret of experiencing a pleasurable learning experience is therefore to choose extrinsic goals that are self-endorsed (Ryan & Deci 2000:55).

Ryan and Deci (2000:55) developed the Self-determination theory (SDT). SDT proposes that extrinsic motivation can vary greatly in the degree to which it is autonomous. Within SDT, they developed the Orgasmic integration theory (OIT) through which they wish to distinguish between the different types of extrinsic motivation. They agree that extrinsic motivation can be an impoverished type of motivation, but that one should not dismiss the forms of extrinsic motivation that can represent a powerful active force to establish change. The following figure clarifies the taxonomy of external motivation and explains how it is possible for external motivation to have value when trying to move people to explore new ideas.

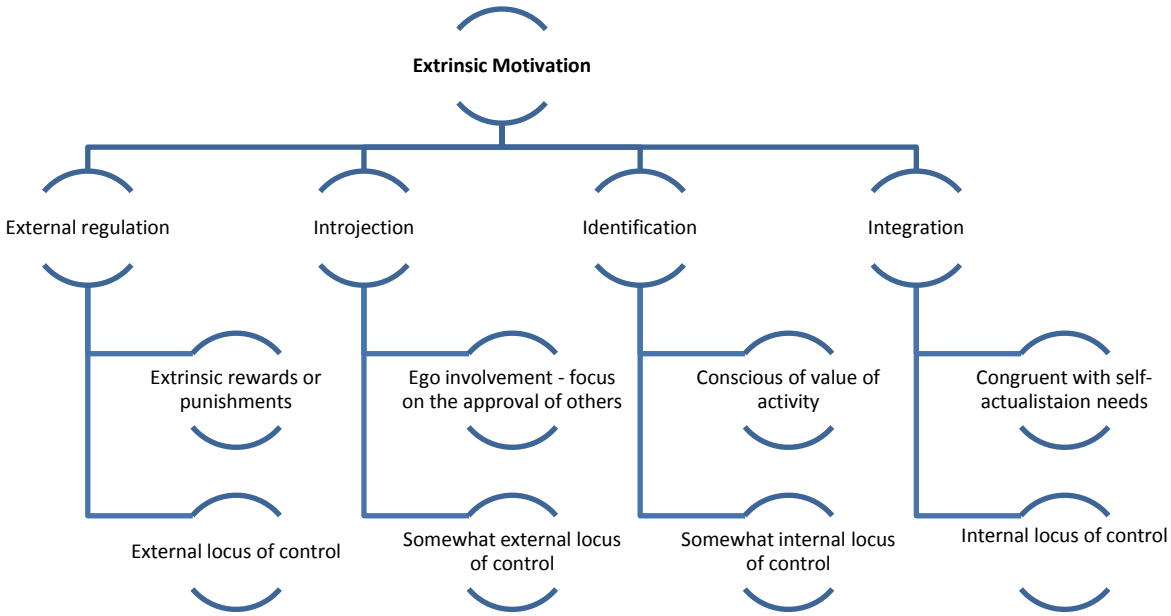

Figure 2.2: The taxonomy of extrinsic motivation (Ryan & Deci 2000:61)

Ryan and Deci (2000:61) determined that there are four types of extrinsic motivation: The first type of extrinsic motivation is labelled *external regulation*. This is the least autonomous and is concerned with motivating someone to do something through establishing extrinsic rewards or punishment. Such a person's perceived locus of causality is external (see Weiner's attribution theory 2.2.3). Operant theorists, like Skinner who was a Behaviourist, also recognise this type of motivation. B.F. Skinner (1938) changed subjects' behaviour by the use of reinforcement, which is given after the desired response. The desired responses were obtained through reinforcers and undesirable responses were decreased through punishers (McLeod 2014). These Operant theorists manipulate subjects' behaviour by means of outside motivators and this stands in direct opposite to intrinsic motivation. The next category is *introjected regulation*, which is a type of internal regulation, but control is still somewhat external as people do things because of external pressure to protect their self-esteem and ensure their feelings of self-worth (Ryan & Deci 2000:62). The next type of motivation moves more to an internal locus of control and is called *identification*. This is when the participant endorses his or her own goals and therefore regulates his or her actions as of own volition because he or she regards these actions as valuable to his or her lifestyle. Finally, the most independent type of

extrinsic motivation is called *integration*. This refers to the fact that a participant will internalise regulation in such a way that it is fully assimilated into his or her idea of that which is to his or her advantage. It is still extrinsic, because this action is instrumental in improving his or her way of life rather than intrinsic, which is performing an action just for the sheer pleasure of doing it (Ryan & Deci 2000: 62).

Intrinsic motivation can be described as an inherent need to know, or an internal drive, where an adult has the need to change his or her behaviour in order to restore equilibrium in his or her life. Maslow (1979:17) described intrinsic education as a personal discovery, a joy of insight, personal growth and the creation of a sense of awe. Intrinsically motivated students' behaviour is exploratory in nature and is usually an end in itself, as opposed to extrinsic behaviour, where the action to change is rather a means to an end.

The researcher wishes to reiterate that this does not necessarily mean that extrinsic motivation will go through stages to where it becomes intrinsic motivation. It simply illustrates that there is a certain value in using the most effective type of extrinsic motivation to bring about a feeling of self-actualisation, which can lead to feelings of intrinsic motivation. For example, an educator who realises the value that will be added to his or her own life by being computer-literate will be far more effective in application than one who was forced to go on a computer course - one more compulsory task to accomplish before being regarded as successful or useful. However, it is also true that there is merit in extrinsic motivation as a starting point. Many people have no idea how their lives could be enhanced by learning something new until they are confronted with it extrinsically. Consequently, the reinforcement of ego and the reduction of anxiety can be an effective starting point to introduce a new way of doing things.

In order to understand how the locus of control can move from being external to being internal, one should know how human beings attribute the successes and failures in their lives. Weiner's attribution theory throws light on this phenomenon.

2.2.3 Weiner's attribution theory

Weiner's attribution theory is included in this literature study because studies have shown that computer anxiety can be overcome through reflection on attribution. Phelps and Ellis (2002:515-524) define computer anxiety as generalised distress and uneasiness experienced by individuals when having to use computers. Their study concentrated on defining the role of a person's expectations of success and the influences of these expectations on these persons' approach to computer use.

Weiner's attribution theory is founded on the premise that an individual's explanations for the reason of his or her successes or the lack thereof influence the outcomes of his or her actions. In other words, a person's beliefs influence his or her expectations, which in turn influence the outcomes of these actions (Weiner 1985:548-573).

The attribution theory is closely related to Bandura's SCT, in that it highlights the importance of expectations and how these expectations can affect a person's behaviour. These causes have various dimensions, which influence the way in which one thinks. The way one thinks is part of one's cognitive structure.

In short, one can say that attribution is an individual's explanation for their successes or lack of successes – the individual finds causal explanations for significant events. It is important to differentiate between causal explanations and causal dimensions. Causal explanations are the specific explanations people make concerning the causes of certain prior outcomes, for example luck, ability or effort (Phelps & Ellis 2002:516). Causal explanations are therefore classified by explaining them with one's intellect. Causal dimensions are the underlying scopes or magnitudes, which are created through the individual's cognitive structure.

According to Weiner (1985:548-573), these dimensions are the following.

Locus of causality: Is the cause within oneself (personal abilities or level of perseverance) or external (difficulty level of the task or coincidence)?

Stability: Is this cause going to change over time or is it going to remain the same?

Controllability: Is the situation under the control of the individual or has it been forced upon her?

Globality: Will success or failure occur in similar circumstances or is this cause limited to a specific situation?

Intentionality: Is insufficient effort to succeed intentional or does one just not have the ability to succeed?

Phelps and Ellis (2002:515-524) demonstrate the interplay between casual explanation and causal dimensions by defining external explanations and internal explanations. External explanations for certain outcomes can be, for example, group interdependence or distractions such as noise. Internal explanations can be aspects like tiredness, hunger, health or mood. Explanations can be those, which are under the control of on individual like effort or determination, while others can be partly under their control, like the context of the challenge, and there can also be those totally outside an individual's control such as his or her ability.

According to Phelps and Ellis (2002:515-524), causal dimensions rather than attributional explanations influence expectancies. The individual's belief in his or her lack of ability is not as influential on his or her outcomes expectations as his or her belief that a cause is stable and cannot be changed.

Henry, Martinko and Pierce (cited in Phelps & Ellis 2002:517), were the first to research the connection between attributional style and successful computer usage. They confirmed that people with a more robust SE, experience a healthier CSE. These participants saw usage of computers as an opportunity to better their chances of success. It is the opinion of this researcher that if people could be more positive about the causes of their success as a whole, they would probably be more successful in attaining computer literacy.

Rozell and Gardner (cited in Phelps & Ellis 2002:515-524), found that negative computer attitudes lead to lower expectations and that these individuals saw the computer as a "foe". Hall and Cooper (also cited in Phelps & Ellis 2002:515-524)

observed an interesting variation on the subject: Participants who experience successes with computers tended to refer to the computer as a technological inanimate object, where as those who experienced difficulty with computers referred to computers in terms of human characteristics (for example: “The computer didn’t want to connect to the internet!”). Although, according to Phelps and Ellis (2002:515-524), very little research had been done so far, there was a positive correlation between computer proficiency and a positive attitude to the acquisition of computer skills.

It was necessary to include Weiner’s attributional theory in this literature research as this shed light on how participants experience their own learning processes. One of the leading experts in the field of andragogy, Malcolm Knowles (1980:40-59), stated that adults have an internal locus of control when it comes to learning. Adults wish to participate in their own learning processes and participate in the planning of their learning material. Knowles’ theory, on how adults learn, is discussed next.

2.2.4 Knowles’ theory of andragogy

Malcolm Knowles can be considered to have been the father of andragogy. Andragogy refers to the manner in which adults learn new skills and internalise knowledge (Smith 2002: 1-11).

Knowles (1980:40-59) determined that adult learners differ from children in that they are self-directed – they determine what they want to learn and also how this will affect their professional lives. With the vast reservoir of experience already accumulated by the adult learner, it is self-explanatory that this readiness to learn is born from the fact that the adult realises that he or she has to broaden his or her skillset to function properly (Knowles 1980:40-59). It is good to understand the reasons why people feel unsure of themselves when it comes to learning new things like computer software applications. Nevertheless, it is better to help such a person to focus on the need to function efficiently, and help him/her realise that this is an “adapt or die” situation so poignantly depicted in Johnson’s “Who moved my cheese?” (Johnson 1998).

Johnson created a sustained metaphor where he compares four mice. These mice depict different types of people; those who love change and embrace it; those who rush ahead without thinking; those who hate change and do anything to avoid it and those who agree to adapt if they calculated that this change would make their lives better. These four characters live in a maze – this maze is a labyrinth depicting our workplace. They are constantly searching for cheese (the things that one needs every day for our survival). Johnson explains that one should expect change in one's life because it is inevitable. He urges one to adapt to change quickly and to enjoy these changes. He also warns that part of development - personal and professional - is to experience and embrace change on a regular basis (Johnson 1998).

Knowles (1980:40-59) defined the following characteristics, which are displayed by successful adult learners. He believed that as a person matures, his or her self-concept moves from being a dependant personality to a self-directed human being. The researcher believes that adults would have to be certain of how learning to be computer proficient would add value to their lives, before any attempt to introduce new learning material would succeed. Knowles (1980:40-59) also found that adults have a vast cache of knowledge gathered through experience and that one should utilise this experience to enrich the learning process. This researcher believes that teachers have a good idea of what the contents of the learning material should encompass - the challenge lies rather in how this learning material should be internalised. Knowles (cited in Smith 2002: 6-7) established further that adults' readiness to learn becomes increasingly orientated to the developmental tasks of their social roles. This researcher believes that adult educators realise that they are teaching the digital generation and that they have to find common ground with the learners that they teach if they want to impart knowledge. Knowles also recognised that adults want to apply newly gained knowledge immediately and with mentionable effect. They want to be able to solve problems by learning new skills. This researcher also believes that teachers wish to be independent from others when constructing lesson material. By being computer proficient, they have access to unlimited study material and can create their own worksheets.

Finally, in 1975, Knowles wrote a self-directed learning programme for adults and explained it as a five-step model of learning and how it should be planned:

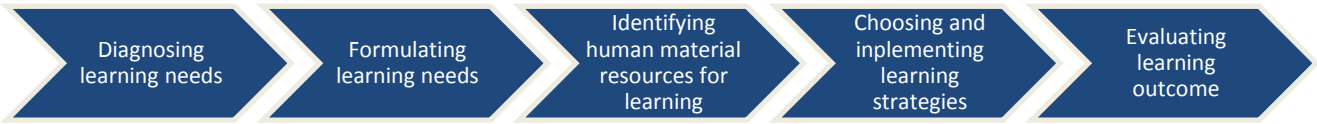

Figure 2.3: Knowles' five-step model (Knowles 1980:40-59)

One can use the pilot study for this research to explain the five-step model: The learning needs were identified through the research data collected, by using the appropriate data collection instruments. This collected evidence assisted in formulating the learning needs, after which mentors were identified as the most appropriate human resource. Vicarious experiences were the learning strategies implemented and the learning outcomes were evaluated once this facilitation has been effected.

According to Knowles (1980:40-59), adults' goals determine the goals and outcomes of their society. Therefore, the strength and commitment of educators should fuel their inclination to lift up and redirect the youth to a better future.

Knowles (1980:40-59) believed that teachers as adult learners should at least reach the following outcomes through their learning experiences. He found that adults wish to acquire a mature understanding of their needs, interests and capacities. He also understood that adults need to develop an attitude of acceptance and caring of others, and that they intend to challenge ideas not people.

Knowles (1980:40-59) found that self-actualised adults developed a dynamic attitude towards life. They experience change as a necessity and see it as an opportunity, not a threat. Adults should learn to react to causes, not the symptoms of behaviour. They should determine the real reason for their successes and failures.

Self-actualised adults are adults who have acquired the skills necessary to achieve their full potential – they determine what is necessary to do their jobs properly and

learn these skills. They tend to understand the value of human experience and realise that they have a duty to mentor the lives of others in such a way to lead them to reach their full potential.

Knowles also felt that teachers should understand their society and be skilful in directing social change. He accentuated that education is the most important place where one can start with remedying inequities (Knowles 1980:40-59).

The following two theories, Information processing theory and Constructivist theory, are learning theories. The researcher needs to understand how learning occurs in order to facilitate learning. Through the learning of new skills, one can accommodate a healthy sense of CSE. These two learning theories are discussed below.

2.2.5 Information Processing theory

Schraw and McCrudden (2012:1-6) sees information processing as the essence of cognitive psychology. They refer to the Information Processing Model (IPM) developed in the 1950s, as the most effective model explaining memory, cognition and thinking.

The IPM consists of three components; sensory memory, working memory and long-term memory (see figure 2.4). The sensory and working memory components manage limited amounts of incoming information during the initial processing, while long-term memory serves as a permanent repository of knowledge (Schraw & McCrudden 2012:1-6).

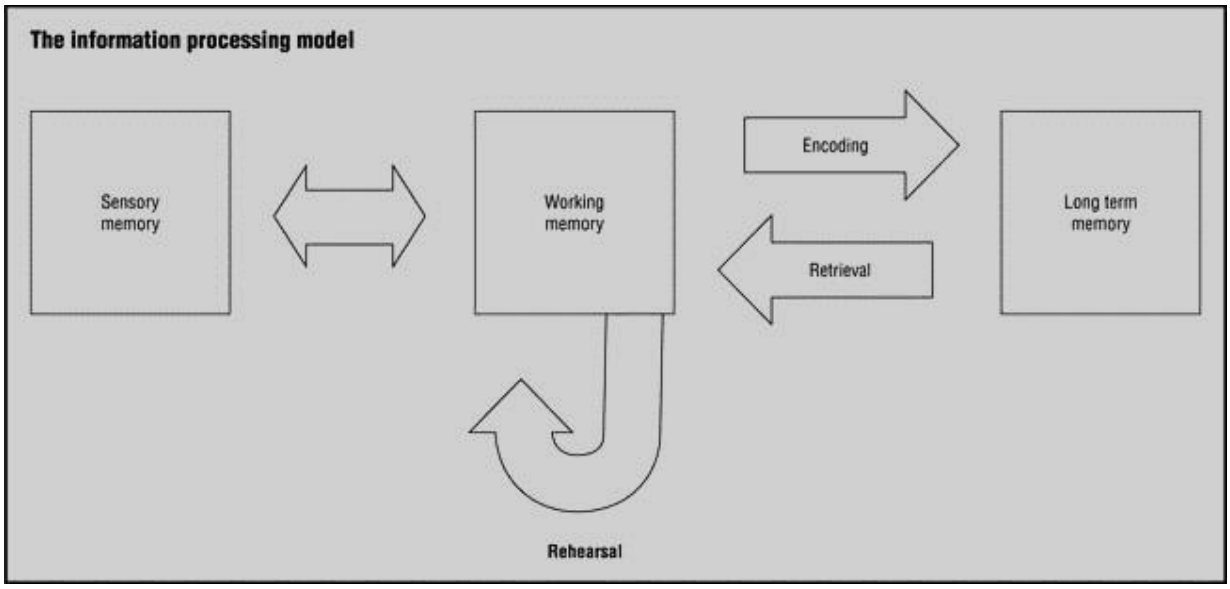

Figure 2.4: The Information Processing Model (Schraw & McCrudden 2012:1-6).

The Sensory memory processes the incoming information, supplied by the environment, for very brief periods–just to screen information for relevancy. If relevant, the information is forwarded to the working memory.

The Working memory is a temporary memory system, which allows new information to link to existing knowledge. There are three key terms, which one should keep in mind when discussing the cognitive process of the working memory and these are *limited attentional resources, automaticity* and *selective processing*.

The first is the term *limited attentional resources;* this refers to the limited nature of the cognitive resources. A successful learner is often not the one with the greatest cognitive ability, but rather the one who discovered the most effective way in which to utilise these resources (Schraw & McCrudden 2012:2). This researcher can therefore conclude that an older adult learner, who is determined to find effective learning skills, can still be more productive than a younger person, with lesser learning skills can. It would therefore be worthwhile for all the participant-teachers to engage in a learning process if this would assist the development of a robust sense of CSE.

Another significant term identified by Schraw and McCrudden (2012:2) when referring to the working memory is *automaticity*, which is about practice making perfect. If one practises an action repeatedly, one develops the ability to perform that action quickly and efficiently. The third key term is *selective processing*. This refers to the act of purposefully focusing one's restricted cognitive resources on stimuli that are most relevant to an immediate task. This researcher feels that participant-teachers are adult learners, who are willing to learn new skills, if these skills are relevant and useful when practising their profession.

The working memory's main task is to select incoming information and deciding whether it is relevant and meaningful to the existing frame of reference. If it is relevant, the working memory mentally repeats the information over and over again and then this information is forwarded to the long-term memory (Schraw & McCrudden 2012:3).

The long-term memory has an unlimited capacity. In order for information to be accepted into the long-term memory, the applicable information must be encoded in terms of relevance and compatibility. Retrieval refers to an individual's ability to search the memory and access the information stored through the encoding process.

According to Schraw and McCrudden (2012:4-5), the information-processing model provides four important implications when one wishes to improve learning and instruction and these are set out below.

The first aspect is that one must be aware of the extreme limited cognitive resources of the sensory and working memory when planning a learning package. Make sure that attention is concentrated on relevant information only and allow the chance to accommodate drilling exercises in order to promote automaticity.

The second implication is that prior knowledge facilitates the encoding and retrieval processes. Allow for other well-developed skills like problem-solving and critical thinking, to facilitate the processes of the working memory.

The third implication is that automated information processing increases cognitive efficiency by reducing the information processing demands: Through sustained regular practice, the mind can be freed to attend to other cognitive processes such as drawing conclusions and making deductions about the relevant information.

Finally, the fourth implication is that effective learning strategies, like *organisation, inferences* and *elaboration* improve information processing. *Organisation* refers to the way in which information is sorted and arranged in the long-term memory. *Inference* is about making connections between separate newly acquired concepts. *Elaboration* is about creating links between existing and new information.

This research is about the facilitation of a robust sense of CSE. In order to develop a robust CSE, one should feel at ease with learning new technological skills. The learning theories explain how one learns new skills and how the feeling of being proficient when using computers will open up a completely new genre of learning possibilities. Adults have experience in their field of expertise and their existing knowledge base must be considered, when teaching them new constructs. Constructs are created through the meanings that people connect to their experiences. This is part of the constructivist perspective on how people learn and adjust their behaviour

2.2.6 The constructivist perspective

According to D'Angelo, Touchman and Clark (2012:1-20), the constructivist perspective focuses on how learners construct their own understanding through their experiences and their reflection on those experiences. In his article on constructivism Ozer (2004:1-3) agrees that humans are better able to understand and internalise information that was constructed by themselves. He further elaborates that learning is a social advancement that involves language, real world situations and interaction and collaboration among learners.

The main contributors to the constructivist perspective are Piaget (1896-1980), Vygotsky (1896-1934) and Dewey (1895-1952). They first noticed that learning takes

place when individuals interact with their environment and thus create new meanings through experience.

Vygotsky (1997:32-41) claimed that the learning process is not so much a process of development, but rather a process of growth and maturation. He explained that the relations between the higher mental functions were once real relations among people. The researcher agrees that we, as learners internalise our experiences and interactions to becoming part of our knowledge base. As Vygotsky stated so aptly, “I act with respect to myself as other people act with respect to me” (Vygotsky 1997:37).

Schreiber and Valle (2013:395-411) explained that social constructivism is a division of constructivist understanding, which holds that knowledge is individually constructed through one’s experiences. The Russian, Lev Vygotsky, developed social constructivism in the 1930s. This school of thought corresponds with Piaget’s cognitive constructivism. There are many similarities between the two theories, but where Piaget departs from the premise that a student is autonomous in his environment, Vygotsky believed that the impact of social and cultural influences has a huge impact. He also believed that people’s background and experiences shape their learning. Vygotsky, cited in Schreiber and Valle (2013:396), reasoned that learning is a collaborative activity where people create new meanings to information gathered through the interaction with other students.

Another social constructivist, John Dewey, was extremely influential in educational philosophy. He claimed that education is about providing tools for individuals to grow, live and contribute to society (Monk 2013:63-64). Monk quoted Dewey as saying in 1938 that “Education in order to accomplish its ends both for the individual learner and society must be based upon experience – which is always the actual life experience of some individual.” This researcher notes that both Vygotsky and Dewey believed that learning could only take place in an environment where it is facilitated by people with the shared inclination of wanting to learn through experience. The researcher agrees with this sentiment, but (like Piaget) believes in the autonomy of

the learner as a unique individual, who has ample personal experience which directs his or her learning process.

Piaget stated that experience is necessary to the development of intelligence, but it is not sufficient in itself. There has to be interaction with experience in order to discover points of reference within oneself (Piaget 1997:5-15). Piaget (1896-1980) cited by Ozer (2004:1-2), further explains the learning process schemes, assimilation and accommodation. The term *Schemes* refer to the organisation of information of how things work. *Assimilation* is when new information entered into the relevant schemes. *Accommodation* is when the new information is internalised into the old schemes so that new schemes are formed. This is an ongoing process. The learner is motivated to learn when there is a discrepancy between his or her existing schemes and reality. This imbalance causes stress and the learner will allow new information to reinstate the equilibrium between his or her schemes and his or her environment.

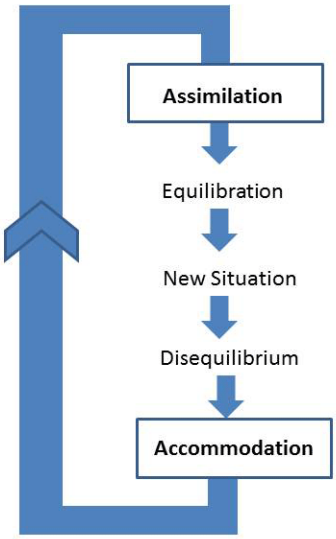

Figure 2.5: Jean Piaget: Assimilation, Accommodation and Equilibrium (McLeod 2009)

Ozer (2004:1-3) states that Piaget's theory of learning and constructivism is based on discovery, and people must have the opportunity to construct knowledge that is meaningful to them. The researcher agrees that the only effective learning process

for the participant adults will have to be to learn from experience and thus be motivated to re-establish equilibrium in their working lives.

Constructivist learning environments encourage learners to gather information, filter the relevant knowledge, analyse and reflect on the usefulness of this new knowledge and finally incorporate this new information into their frames of reference. The value of being computer proficient can only be accentuated when the participant-teachers are motivated to see the lack of computer-literacy as a cause of incongruence in their work situation. Only then would they want to reinstate equilibrium between their existing schemes and their environment.

Laffey, Tupper, Musser and Wedman (1998:73) explain that learning takes place when experience brings about a change of meaning. Teaching methods must take account of the distinctiveness of adult learning, and accommodate the collaborative process between instructor and learner. Computers are mechanisms facilitating mutual planning, organising and control of the learning process. Newby et al., (2006: 34-37) agree that learning is a continuous process and is facilitated in groups. Technology can accommodate collaborative communication between instructors, students and experts in the field of learning.

The theories studied above, establish a theory base for the research question, in that they confirm the essential nature of teachers as far as their professional lives are concerned. The theory base also focuses the mind on the challenges they experience. Bandura (1994) simplified the intricacies of how people judge themselves and their abilities. Maslow (1943) clarified people's motivational hierarchy and highlighted the fact, that even though one would wish to move to a higher order of needs platform, basic needs should be addressed before attention can be given to reaching one's full potential through self-actualisation. Weiner (1985) explained how people experience their successes and to what they attribute their failures. The dimensions of the attribution theory accentuate how adults actually experience these challenges and life-changing practices that come their way. Knowles (1980) reiterated how adults think and learn. He stated that adults have unique assumptions when it comes to life-long learning and that one should not underestimate their ability to know what they need. They display an intentional effort

and they are motivated to invest in bettering society through effective change management. The theoretical perspectives of learning, Information processing theory (1950) and the constructivist approach (1896-1980) explain how the learning process can be facilitated in the most effective manner. These processes accentuated again the powerful role that technology can play in the implementation of the learning process.

2.3 RESEARCH ON TEACHERS' INTERACTION WITH COMPUTERS

During a conference in Dar Es Salaam in 2011, Blignaut and Esterhuizen (2011:1-2) stated that teachers' positive attitude towards computers is greatly influenced by their perception of the usefulness of these computers. If computers were seen as advantageous, this would greatly improve the teaching and learning process. Attitude is not the only factor, however; computer competency is necessary in using this technological source to its full potential. In other words, it is not only necessary to promote a positive attitude towards using computers, but teachers also have to attain a high level of competency related to computers in order to experience the full impact of a positive web-based teaching and learning process. During the research of Blignaut and Esterhuizen (2011:1-2) they observed that the attitudes of student-teachers improved dramatically towards computers once their limitations of access to computers and connectivity were solved. They also found that the student-teachers believed that computers would change the course of education positively in South Africa (Blignaut & Esterhuizen 2011:1-2).

In their article, *The relationship between keyboarding skills and self-regulated learning*, Lubbe, Monteith and Mentz (2006:281-293), found that self-regulated learners perform better at keyboarding skills than less self-regulated learners. Research shows that using a computer keyboard effectively leads to the development of the following skills: perceptual-motor, sensory-motor and conceptual motor skills. Perceptual skills are used when text is transferred from notes or book and the layout of the document must be planned, while motor skills are implemented in the use of fingers typing in information. On the other hand, sensory-motor skills are utilised when students remember where keys are situated while typing in data. In addition, conceptual-motor skills are practised when meaningful sentences are

formed when compiling assignments. In other words, good keyboarding skills are necessary for good writing ability and good writing skills are necessary for effective transfer of knowledge.

Lubbe, Monteith and Mentz (2006:281-293) also found that, for learning to take place, one has to go through three phases: forethought, performance and self-reflection. During forethought, the learner plans his or her strategies and sets his or her goals. Then follows the performance phase where the goals serve as guidelines for executing the necessary learning tasks as well as monitoring the process, which is followed up by the self-reflection phase where adjustments are made to ensure the successful completion of the task. This is a cyclic process leading to strategic planning, which in turn leads to successful learning (Lubbe, Monteith & Mentz 2006:281-293).

The researcher noticed that self-motivation consists of, amongst other aspects, outcomes expectation and self-efficacy. A positive expectation that one will be able to master a difficult skill like computer literacy is a powerful component that can nurture the courage required to be a life-long learner. This type of learning is necessary to enhance the learning and teaching experiences in South African schools.

2.4 CONCLUSION

This literary review was created to establish the theory base on which this research rests. The review illustrates that extensive research has been done in the field of SE and confirms the importance of computer literacy when trying to establish a robust CSE. A robust CSE will in turn enhance the educational possibilities concerning lifelong learning. The need for CSE in the educational field is vital if a skilled nation is to be created and nurtured. This research of limited scope highlights the motivation behind teachers' efforts in learning new computer skills. The study also shows how their fears are relevant and should be addressed at the highest governmental level. If one can establish what is necessary to bring about a healthy sense of CSE and therefore encourage the use of technology by teachers, who in turn can help build a

healthy South Africa, one can start to plan the recovery of a beleaguered educational system.

Chapter 3 describes the research methodology necessary for an empirical study done to address the research problem. This empirical study is conducted to determine which aspects need to be addressed when attempting to facilitate the development of healthy CSE among primary school teachers.

Chapter Three: Research methodology

3.1 INTRODUCTION

Empirical research is research done by collecting evidence through systematic study (McMillan & Schumacher 2006:10). The findings arising from this research can lead to new methods in facilitating a robust sense of CSE among teachers. In Chapter 2, it became clear that the most effective way in which an adult can learn is through experience. However, one must keep in mind that these experiences have to be efficiently facilitated in order for learning to take place in such a manner as to cater for the enhancement of their sense of CSE. The purpose of this research can be seen as emancipatory, in that it creates an opportunity for teachers to be empowered.

The main research question for this study therefore is: How can a robust sense of CSE in teachers be developed in a South African primary school?

Following from the main question, and to gain a better understanding of the situation, the following sub-questions were addressed:
What is the present state of teachers' CSE in a South African primary school in Mpumalanga?
What computer technology skills do primary school teachers have?
How can computer skills be cultivated in order to enhance teachers' CSE?

This researcher endeavoured to find a way to facilitate a healthy sense of CSE in teachers' professional work and to determine how a more robust CSE can influence their overall SE.

In this chapter, the rationale for the empirical research is given and the research design is explained. The researcher demonstrates how validity and reliability were ensured. The collection and analysis of data is discussed as well as how ethical issues were addressed.

3.2 RATIONALE FOR THE EMPIRICAL RESEARCH

According to Macmillan and Schumacher (2006:10), empirical research means that evidence is gathered by systematic research methods rather than by opinions and authorities. Although many policies to promote computer proficiency have been instituted and computer literacy is included in the curricula of most tertiary institutions, the truth as one experiences it in real life is relevant in this study.

An in-depth review of literature was done before and during the empirical data collection. A literature review creates a connection between this research and relevant research done by others on this specific topic. The literature review can identify successful data collection methods and can provide insight into choosing the appropriate research design. This is necessary to establish a well-developed knowledge base of relevant concepts and to find explanations for phenomena that may occur during one's own research (Newby 2010:189-219).

A qualitative research design seemed to be the most appropriate method of gathering information about people's experiences in life. This led to the decision to use methods true to empirical research. Information was gathered through focus group interviews, questionnaires and an observational narrative. This triangulation would ensure a truthful depiction of the situation as currently experienced.

3.3 RESEARCH DESIGN

The research paradigm, which is the frame of reference of the research, directs the selection of the research design and strategy and regulates the problem formulation, actions, findings and conclusions. This research is mainly concerned with understanding the highly individualised social phenomena of CSE. A non-positivistic paradigm was chosen to discuss questions concerning motivation, self-efficacy and the way in which one learns. This approach emphasises the fact that reality is defined by knowledge gained through personal experience, rather than from accepting sources outside an individual, and is concerned with the interactions and experiences of humans (see section 1.5.1.1).

Creswell (2008:3-20) stated that the selection of a research design is based on the nature of the research problem, the researcher's personal experiences and the audiences of the study. He explained that qualitative research is meant for the exploration of the values and meanings that individuals or groups give to certain social problems. In the case of this research, the key assumption has been that the facilitation of CSE was possible if the participant-teachers understand the value that this facilitation might have. They will only allow this facilitation if they think that it will improve their ability to deal with the challenges presented to them in their working lives.

The research design chosen for this study does, however, include a Likert style survey after the open-ended questions. This was done to triangulate the answers given by respondents to a certain extent. The inclusion of this survey prevents the design from being purely qualitative, but the exploratory nature of the research allows for a measure of mixed methodology (McMillan & Schumacher 2006:403).

According to Newby (2010:115), qualitative research is concerned with understanding how people choose to live their lives and perform their everyday tasks in life. This type of research is done to identify the values that they attach to certain skills and how they experience other people's perception of their strengths and weaknesses. Qualitative research is holistic in nature. It allows the researcher to see the whole picture, using different techniques and instruments, which can be utilised as the need for them manifests itself. In order to allow a true rendition of how teachers really feel, one needs to investigate a situation, which is as natural as possible to their everyday experiences. Newby (2010:115-120) rightly mentions that there is not only one reality; the participants in this research are complex individuals with diverse sets of skills. Although one would like to discover a single truth, it does not exist in a singular reality and therefore the qualitative design is very appropriate for this study.

McMillan and Schumacher (2006:313-316) refer to reality as a multi-layered social construction and that specific groups ascribe specific meanings to their experiences. They state that the goal of the researcher, when choosing the qualitative research design, is to understand a social phenomenon from the participants' perspectives.

This researcher gathered information through focus group interviews, an extensive questionnaire that includes several open-ended questions to allow respondents' own opinions to be voiced, followed by a Likert-style survey. An observational narrative was compiled to introduce the characteristics of a teacher whose CSE could be enhanced.

3.4 RESEARCH METHODS

3.4.1 Introduction

The participants, initially chosen to contribute to the research, came from the whole teaching- and management staff (originally forty) of the school. The school is situated in Secunda, a large and dynamic city in rural Mpumalanga. The school currently has fifty teachers on the payroll and over a thousand learners. The Department of Basic Education and an affluent governing body manage the school jointly. The involvement of this governing body ensures a teacher ratio of not more than one teacher to thirty learners. Sampling is discussed in detail under 3.4.2. Data collection methods, as well as data processing methods are discussed later in this section.

3.4.2 Selection of participants

The choice of convenience sampling was influenced by the availability of research participants in the school. Even though the sample was limited to this specific school, the personnel are like many primary schoolteachers throughout the country (McMillan & Schumacher 2006:125).This school is an example of those more affluent schools, which are jointly managed by the Department of Basic Education and the school governing body. This symbiosis ensures a level of quality in the type of teacher employed - teachers have to be fully qualified and registered with The South African Council of Educators (SACE). The school has a good infrastructure as far as technological support is concerned, and has the ability to provide information technology facilities for both teachers and learners.

The focus groups consisted of a small distinctive group of teachers in the primary school. Two focus groups were used. Focus group one consisted of older teachers whose teaching experience was well developed even though their computer proficiency was lacking. The researcher wanted to determine whether the lack of computer literacy was a factor influencing their sense of CSE. The participants of focus group two were younger and they were far more technologically proficient than focus group one. They were, however, lacking in professional experience and the researcher wanted to ascertain whether this lack of professional experience could be overcome by a healthy sense of CSE and how this affected their general SE. Their biographical profile and computer experience, as well as computer literacy differed and this enabled this researcher an effective picture of the situation at the school. The participants were specifically chosen to explore the relationship between professional SE and CSE (see tables 4.1 and 4.2).

The questionnaires (see Appendix C) were distributed to all forty staff members. In the end, only thirty-four of the forty possible teachers returned the completed documents. All the teachers in the school declared themselves willing to contribute after the reason for the research and its objective has been explained.

The observational narrative was preceded by an extensive and ongoing personal relationship with the teacher concerned. Even though this relationship was personal, the researcher attempted to ensure the validity of the study by providing the necessary background on how this could possible influence her line of thought. This observed teacher was in truth the inspiration for the research. This researcher noticed that she had the capabilities to master many other technological aides, but that the computer as such, seemed to be the source of an undefeatable terror for her. It became clear that her inability to deal with the challenges brought about by her computer was born from a weak sense of CSE. The question then surfaced as to how one could facilitate a robust sense of CSE in order to open up a whole world of possibilities and resources. This researcher is involved with computer training at the school and manages the media centre where computers are available to teachers for preparing lesson material. Even though the participant, discussed in the observational narrative, was never under formal observation, this researcher has had

many discussions about the subject of CSE with her, and has come to understand her feelings about computers in detail.

In order to understand the issue of CSE and how this may influence general SE, as well as influencing the group and their effectiveness as teachers, the observational narrative provided information on typical reactions and common fears that may exist as a result of being confronted with technological changes (Newby 2010:253-255).

An attempt was made to triangulate the findings collected through these sample groups, by comparing the opinions of the focus groups, the answers given in the questionnaires and through constant observation done by the researcher throughout the past seven years teaching with these teachers.

3.4.3 Data collection

3.4.3.1 Focus group interviews

Two focus groups were chosen to illustrate the differences experienced by older and younger teachers as far as computer usage and CSE were concerned. The two focus groups provided data for a brief comparative analysis demonstrating the different attitudes of teachers of different ages, concerning computers.

A focus group is a group participating in a session led by a researcher using probing questions in order to provoke informative discussions by the members of the group. It also provides a measure of the dependability of the participant population and helps to narrow down suitable sample questions for the questionnaires and the case study. These purposeful “conversations’’ vary between informal interactions and open-ended interviews. General questions established patterns and specific meanings to help determine the respondents’ frames of reference - portraying personal values and beliefs. The advantage of these open-ended and free-response interviews lies in the fact that they remain issue-based (Newby 2010: 343-345).

The research focus groups differed in aspects concerning age and professional, as well as computer experience (see section 3.4.2). There were five participants in each group. Focus group one consisted of an older generation with less accumulated

computer experience but more professional experience. They were on a managerial level and used to secretarial services. Focus group two consisted of a younger generation with a higher level of computer literacy, but with less teaching experience. The interviews were recorded by the recording facility of a cell phone and transcribed to help accommodate data processing and analysis (see Appendix B for the transcription of both interviews). These interviews gave an indication of the frustrations of the participants who were computer proficient as well as the participants who did not have a lot of computer experience. The focus group interviews provided guidelines to help the researcher in the compilation of relevant questions.

3.4.3.2 Questionnaire

The focus group interviews were done before the composition and application of the questionnaire to determine the scope of the situation experienced. A questionnaire was compiled using clear single concept questions relevant to the study (see Appendix C). The first section of the questionnaire consisted of questions determining biographical details like age, professional experience, level of computer literacy, and general computer usage. This was done to establish a background or frame of reference against which the open-ended question section could be interpreted (see section 4.2.2).The open-ended questions gave the respondents an opportunity to speak their minds, while confidentiality was guaranteed (see Appendices A and C for examples). The anonymity, which these questionnaires ensured, created a more lenient and non-judgmental atmosphere where people could let their opinions flow unchecked and this researcher could get a truer picture of how people really felt. Interpretation can be difficult if the researcher cannot observe respondents and ask clarifying questions. This can be addressed by using different questions with the same agenda to ensure a true rendition of the situation. The open-ended section is followed by a number of short clarifying questions using a Likert scale for the answers (see section 4.2.2). Even though the Likert scale is a quantitative research method, it was necessary to triangulate the answers given in the open-ended questionnaires. The Likert items served the purpose of focusing the respondents' thoughts and confirming their opinions. The research was thus not

purely qualitative, but had a brief mixed method feature to help triangulate the open-ended answers for this researcher through participant confirmation.

McMillan and Schumacher (2006:324-325) suggest that qualitative researchers should use multi-method strategies to enhance validity, but should concentrate on one method as the central data collection method. They also mentioned that methods are interwoven from time to time, because the one method occasionally necessitates another in order to clarify a concept. In this case, the questionnaire was the central data collection method. The focus group interviews helped the researcher to determine possible problem areas necessary to explore, while the observational narrative gave a more detailed illustration of how the participants experienced the challenges brought about by technology and how a healthy CSE could enhance their quality of work experience.

3.4.3.3 Observational narrative

Evidence and data explaining the phenomenon of CSE of teachers were gathered through a limited case study or observational narrative. According to Newby (2010:51-54), this type of study is a study of an individual situation (such as a group of teachers with the same problems). The teacher whose situation was researched was a typical teacher with a fair amount of professional experience. Data was collected through constant interaction with the participant. These encounters included work sessions and the compilation of worksheets in the media centre where teachers could use computers to compile learning programmes and material. The researcher had informal discussions with her on an ongoing basis and concluded that this participant was an example of many others like her who utilised the media centre. The researcher made notes after many of these discussions in the past year and included the information gathered in the research. This instrumental observation provided a better understanding of the issue of CSE and determined how CSE influences general SE (De Vos et al. 2005:272). This data collection instrument was chosen to help the researcher understand the essence of an individual's experience concerning computer proficiency and CSE, and serves as an illustration of what is commonly experienced by teachers and how they relate to technology.

3.4.4 Data processing

Data analysis involves organising the data using the research question as a starting point. The data collected was analysed separately per collection method. In this case, they were focus group interviews, questionnaires and an observational narrative. The prior knowledge and personal experience of the researcher played a considerable role in the identification of certain patterns, for these emerged throughout the years working with teachers. Finally, the data itself tends to reveal certain configurations; sometimes, different participants came to the same conclusions about the same subjects, showing that there are universal truths (McMillan & Schumacher 2006:367).

According to De Vos et al. (2005:336-339), it is necessary to organise the data gathered by means of an inventory to ensure that all aspects which the researcher wished to explore were covered. Through this organisation, evolving insights were being generated. De Vos et.al, warn that it is important to keep a master copy of the original data collected in order to retain perspective.

Newby (2010:459) agrees that qualitative data analysis is a generic process where one shapes data into a form, where it can be interpreted in such a way that it will contribute to the research issue even if it does not fully answer the research question. He mentioned that this process has four stages: *preparing the data*, *identifying basic units of data*, *organising the data* and *the interpretation of the data*.

3.4.4.1 Preparing the data

The data collected is in the form of interviews, questionnaires and observations. The questionnaires are text-based data, which could be used immediately. The focus group interviews were recorded and were transcribed. The interviews took place in Afrikaans. The observation was done over years of working with the participant teacher and being her friend. These interpretations were noted done in the past year and used to explain her reactions.

3.4.4.2 Identifying basic units of data

De Vos et al. (2006:336-339) warn that one should always have an open mind when dealing with data to be able to notice subtle undercurrents present. They advise further that it is necessary for the researcher to apply some sort of coding scheme in order to categorise the information gathered. They also counsel that although the researcher plans to use a specific coding method, new understandings may well emerge and alter the initial premise (De Vos et al. 2005:336-339).

Codes are the descriptive names for subject matter or topics. The researcher identified which aspects of the participants' experiences stand out and noted them in the margin of data collected. In some cases, certain topics reoccurred (McMillan & Schumacher 2006:368). In this research the data was coded as: activity (actions around technology); content (information which needs to be dealt with); and affect (the emotions and stress related to this interaction between technology and workload).

Coding, according to Newby is the process of identifying concepts from text, speech or behaviour. Basic data units are linked through coding and through this, an interpretive hierarchy is created (Newby 2010:651). Because CSE is grounded in the emotional part of a person's being and is influenced by his or her reactions towards specific content, the researcher has decided to use the Interpersonal process code (IPC). IPC was developed by Rusby, Estes and Dishion in 1991 in order to understand how content, activity and emotional experiences interact when a person is dealing with any stressful situation (Rusby, Este & Dishion 1991: 1-49).

3.4.4.3 Organizing the data

The data collected was studied to find certain key aspects, which stood out in the answers provided, by both the focus groups and respondents completing the questionnaires. If a keyword stood out during the information received, it was interpreted according to the level of Activity, Content and Affect, which manifested in the answer. For example: in a question about keyboard usage the answer given can illustrate a certain emotion (affect), say someone experiences stress when having to

use the keyboard (activity) to create worksheets for a lesson (content). This was all entered on a grid to illustrate which percentage of people felt stressed when working on the keyboard, which percentage felt at ease about the use of keyboards and which percentage of people felt positive about working with the keyboard when creating worksheets. So the collected data was coded and the different codes were classified and defined by IPC (Rusby et al*.* 1991: 6-7).

From these specific interpretations, certain themes stood out: *professionalism in relation to computer literacy*; *teaching and how technology influences it*; *the value of compulsory computer training for teachers;* and *how CSE can be facilitated*.

The researcher had to organise the data according to the specific coding scheme, which she decided to use (De Vos et al., 2005:338). IPC divides data into codes related to Activity, Content and Affect (Newby 2010:463). CSE has its origin in the *emotion* one experiences when having to *act* and relate to certain *content*. In other words, a weak sense of one's ability to deal with computers, computer technology and software could lead to a diminished sense of self-worth and belief in one's ability to deal with these challenges. The researcher will now explain how the coding was applied to the data collected. The codes and their various sub-categories are discussed below.

i. Activity

Activity is regarded as any action demanded in having to deal with everyday challenges at work and at home. At work, this could include teaching, the gathering of information to prepare lesson material, administrative demands made by the department regarding assessment and other "red tape". At home, the activities are less demanding like leisure activities and conducting business.

The coding for Activity is divided into following topics: A1 = teaching, A2 = gathering learning material, A3 = managing administration, A4 = leisure activities and A5 = conducting business.

ii. Content

Content can be described as those physical aspects with which teachers have to deal with. The first aspect is compiling learning material, work sheets and tests. The second aspect is concerned with teaching practices such as difficult subject concepts or weighting demands given by the authorities regarding assessment. Finally, the content, which is most relaxing concerning computers, can be anything like social networking to entertainment.

The coding of the content is divided into the following topics: C1 = computer work, C2 = new software and C3 = internet surfing.

iii. Affect

Affecting, refer to the emotions one experiences when dealing with activities and a specific content. They are organised under the following coding: E1 = contentment, E2 = caring, E3 = neutrality, E4 = antagonism and E5 = distress.

The manner in which these aspects relate to each other illustrates how certain actions, when interacting with specific content can influence the participants' emotional state and how, in turn, this can influence these teachers' sense of CSE. If the latter is established, one can find certain remedies, which may facilitate a robust sense of CSE.

3.4.4.4 Interpretation of the data

McMillan and Schumacher (2006:372) believe that the ultimate goal of qualitative research is to discover patterns, which will lead to general statements about the relationships between the categories identified. This can only happen if all aspects of people's situations, mental processes, actions and in the end their values systems and beliefs are understood.

Newby (2010:466) stated that coding could highlight facts or describe situations. One should look at the data collected and interpret what this data means. Sometimes when data is taken at face value it is just summarized as a re-expression of what the

data is telling us. At other times however, one should operate on a more abstract level and infer some of the information given. Coding was done by identifying specific and recurring themes that surfaced from the data collected.

In order for the data to be accepted as valid, the researcher had to put certain measures in place to ensure trustworthiness and triangulation.

3.5 VALIDITY AND RELIABILITY

3.5.1 Trustworthiness

The qualitative research design is extremely versatile and therefore there are things that can go wrong. In order to ensure quality assurance, one has to look at the following aspects: credibility, dependability and confirmability. According to Newby (2010:121), qualitative researchers replaced the quantitative quality assurance measurements of validity, reliability and objectivity with the qualitative quality assurance above for the following reasons. Validity is meant to insure that instruments measure accurately those aspects that they are supposed to measure. Credibility assures us that the researcher provided a correct interpretation of the meaning of the participants, but interpretation can be influenced by the researcher's own frame of reference, no matter how she tries to guard against it. In this research, credibility was ensured through triangulation. After the focus groups had been interviewed, the researcher came to certain conclusions, which led to the compilation of the questionnaire. The questionnaire consisted of open-ended questions to begin with, which allowed respondents to air their views unreservedly. Their opinions confirmed information collected through the focus groups. The questionnaire was concluded with a few Likert items to ensure that the researcher understood the answers given in context. The participant featured in the narrative was part of the focus groups, completed the questionnaires and confirmed the findings of the researcher during an informal interview. Even though the identity of the participant in the narrative was never revealed, she was an informed respondent about the research and had time to think of how she experienced CSE. She could therefore provide valuable insights through her own perceptions.

Reliability assures that that the outcomes measured over time will remain the same. Dependability replaced this as a quality assurance in qualitative research by ensuring that the researcher explained the context in such a way that the audience would be able to come to the same conclusion as the researcher. Outcomes cannot remain the same when qualitative research is repeated because, as Heraclitus so aptly said, “one cannot step in the same river twice”. People do not remain the same, their experiences change them irrevocably. The researcher attempted to describe the sample group as thoroughly as possible. The school setup was discussed in detail and the level of technological support was determined.

The third quality assurance measure, which is usually a cornerstone of conventional research, is objectivity. This means that the researcher remains untouched by the research and another researcher would reach the same conclusions. Qualitative research is in essence subjective, so another measurement – that of confirmability is needed. This means that the researcher has to disclose his or her own bias and gather enough information to allow the audience to accept his or her deductions as conclusive (Newby 2010:121).This researcher acknowledged that she was a participant observer and part of the sample group involved. She also described her involvement in the lives of the respondents and explained how she came to know how they experienced CSE.

In order for credibility to function, the parameters of the study have to be firmly established. The parameters of this research can be established by describing the participants, who are teachers who are prepared to discuss their computer usage in their professional work while acknowledging the state of their CSE. The setting was a primary school in Mpumalanga in a suburban area. The participants had free access to computers. If in future anyone wishes to replicate this research, the subjective nature of both the setting participants and the situation must be kept in mind.

Dependability can be achieved if the researcher has described the context to such an extent that the audience has to agree with the findings of the research. Finally, objectivity is replaced by confirmability, i.e. the assumption that others would come

to the same conclusion if the test were to be replicated. Again, this can only be done if the participants and their situations are exactly like the previous group.

The only sure way to ensure trustworthiness in qualitative research is to triangulate the data collected.

3.5.2 Triangulation

Triangulation is done to cross-validate the findings of the researcher through the utilised data collection methods. The focus group interviews highlighted certain areas of interest, which could be further investigated. For example, the question of compulsory computer training was regarded positively, if it served a worthwhile purpose, by both the focus groups and the respondents answering the questionnaires. The questionnaire existed of a series of open-ended questions, which were confirmed by a brief survey using Likert scale items. If, for example, the respondent's answer to the open-ended question "How would access to the internet improve your ability to teach?" was positive, his or her choice when answering the Likert items "Create effective teaching methods" and "Improve learning experience of student" should be positive. In this way, the researcher could be assured that she understood the answers given in the open-ended questions.

The narrative was done after the participant teacher who served as an example of teachers with a weak sense of CSE had completed the questionnaire. After the narrative had been finalised, the researcher did an informal interview with the teacher in question to attain participant confirmation. Macmillan and Schumacher (2006:374) confirmed that these confirmation methods are effective in that they help the researcher to notice and explore certain anomalies, as well as regularities, which form patterns of interest.

This is the reason why three different data collection methods were used, namely focus groups, a questionnaire, and an observational narrative.

3.6 ETHICAL ISSUES

In order to ensure that research is done in an ethical manner, informed consent was requested from the school management as well as individual participants (see Appendix A). Confidentiality and anonymity were ensured by protecting the identity of individuals (McMillan & Schumacher 2006:334).The participants in the focus groups were only identified by codes, the questionnaires were completed anonymously and the participant in the narrative was never mentioned by name. The ultimate goal of the research has been to enhance the lives of the teachers involved and not to hurt them in any manner.

A consent form (see Appendix A) accompanied the questionnaire, which provided the following information. It explained by whom and why the research was conducted. It clarified the importance of their response and the value of their input. The contact information of the researcher was provided and the respondent was ensured of anonymity (Eiselen 2012:8).

3.7 CONCLUSION

This chapter firstly elucidated the rationale for the empirical research. The research design was explained, addressing the aspects of the non-positivist research paradigm and the mixed method research approach. The researcher demonstrated how validity and reliability are ensured through triangulation. Data collection, using focus interviews, questionnaires and an observational narrative, was discussed. The data analysis, using IPC coding, was explained and ethical issues were addressed.

The data collected through this empirical research is presented, analysed and discussed in the following chapter.

Chapter Four: Data analysis and interpretation

4.1 INTRODUCTION

In Chapter 3 the rationale for the research, the research design and research methods of data collection and processing were discussed. Ethical measures as well as validity and reliability assurances were put in place. Chapter 4 now concentrates on the presentation, analysis and interpretation of the data collected throughout the study.

In this chapter, the data collected through the instruments, focus group interviews, questionnaires and an observational narrative is presented. These instruments were chosen in order to provide the trustworthiness brought about by triangulation. The analysis of the data gathered was done according to the IPC (see section 3.4.4.2).

4.2 DATA ANALYSIS

4.2.1 Focus group interviews

Newby (2010:117-119) mentions in his work on educational research, that qualitative research is not always concerned with one reality only. This means that, although there is only one universal truth to be discovered, people's experiences of this truth may vary according to their frames of reference. Even though there is a singular truth, people may experience it differently and therefore define it differently. The qualitative researcher's task is not to observe how people behave from an outsider's point of view, but rather to understand how individuals see and experience their own world.

With this understanding established, two focus groups were compiled. Focus group one consisted of older people, who had a great deal of professional experience and a variety of computer experience. Computer literacy was not automatically assumed and the people, who were computer-literate, had been compelled to teach themselves. Focus group two consisted of younger people, who had been trained in computers as part of their general university curriculum. They had however, limited

professional experience. Tables 4.1 and 4.2 indicate the biographical range of the focus groups interviewed.

Focus Group One					
ID	Gender	Computer experience	Qualification	Age	Teaching experience
A	Female	Good	Diploma	40	20
B	Female	Average	HEd	48	15
C	Female	Average	Degree	50	25
D	Female	Excellent	Degree	52	30
E	Male	Poor	HEd	50	30
F	Male	Poor	Diploma	55	35

Table 4.1: Focus group 1

Focus Group Two					
ID	Gender	Computer experience	Qualification	Age	Teaching experience
A	Female	Good	Diploma	27	6
B	Female	Excellent	HEd	22	2
C	Female	Good	Degree	25	4
D	Male	Excellent	Degree	23	2
E	Male	Good	HEd	27	6
F	Male	Excellent	Diploma	30	7

Table 4.2: Focus group 2

The same questions were asked to both groups and the following information emerged.

The first question: “Who has access to a computer at home and at work?”, related to the access to computers at school and home and the second that flowed out of this was related to the manner in which school work was being done by the teachers. In

focus group one the participants were mostly limited to one computer at home. They had access to it but it could not be used at their discretion only. The participants of focus group two all had their own laptop computers.

The second question: “Where and how do you do your schoolwork?” was about how these teachers were dealing with their workload. A third of focus group one did their work by hand and asked the secretaries of the school to type it for them. (It should be mentioned that those who used the secretarial resources were also part of management and had the secretaries at their disposal, so there was no great need for them to do their own typing). The members of focus group two worked on their own laptops, but brought the work to school on a memory stick to be printed (possibly in order to save on printing costs). One of the members of focus group two used the secretaries to type his written work, because of pressure from the older teacher with whom he was working, and who was very particular about the format of the work presented.

The third question: “How does your access to computers influence your lesson planning and administration?” was about the effect access had on the way in which teachers planned their lessons and did their administrative work. The participants of focus group one were quite set in their ways and did not appreciate the prescriptive nature of the new syllabi (CAPS) determined by the Department of Basic Education. The National Curriculum and Assessment Policy Statement (CAPS) is a single, comprehensive, and concise policy document, which replaces the current Subject and Learning Area Statements, Learning Programme Guidelines and Subject Assessment Guidelines for all the subjects listed in the National Curriculum Statement Grades R to 12 (Curriculum and Assessment Policy Statement: 2013). The most significant change brought about by CAPS is concerned with the weighting of the different aspects of their subjects. Focus group one’s teachers expected the younger people to contribute their expertise to the retyping of the lessons in the new format. They still worked with a pocket calculator and pen when it came to the new manner of recording marks. They felt that entering the data on a computer would be just a neat way of doubling their initial work. The younger people, of focus group two, were working according to the prescriptive CAPS textbooks, but were compiling their

tests and examination papers on computers. They were frustrated by the older participants' unsympathetic evaluation of their work. They also felt that freer access to computers would improve their working conditions. (In order to address this need, extra computers - solely for the use of teachers - with internet connectivity, were installed in the media centre. This was met with huge enthusiasm and approval). As far as the administrative work was concerned, the teachers of focus group two were frustrated by the fact that they had to fill in their marks on a prescribed form by hand, even though they had a perfectly legible record of the data on their computers already.

Question four was: "Do you think in-service teachers should undergo compulsory computer training?" A few of the participants of focus group one were in favour of such training, if it was lesson plan specific. They wanted to avoid unnecessary paperwork at all costs. Most however, were not interested in learning new things and felt that the younger generation should carry the bulk of the responsibility for learning technological skills. The younger teachers of focus group two felt that they had an existing knowledge of basic computer software, but would welcome software specifically designed to calculate marks according to the prescriptions and specifications of the Department of Basic Education. They also felt strongly that training should be compulsory for all teachers and not only for those who decided to attend classes (see Appendix B for transcription).

4.2.2 Questionnaire

The questionnaire (see Appendix C) began by determining a few demographics. Of the thirty-four respondents, five were male and twenty-nine were female (see table 4.3). Twelve of the teachers had five years and less teaching experience; however, twelve of the respondents have more than twenty years' experience. Seven respondents' experience was less than ten years but more than six and the remaining three were evenly spread between more than ten and less than twenty years' experience. Eleven teachers were between the ages of twenty and twenty-nine, eight were younger than forty, but older than thirty, eight were between forty and fifty and the remaining seven were older than forty and younger than fifty.

Fifty percent of the respondents had an average computer ability according to themselves, a third of the respondents thought they had an above average computer ability while twenty percent of the teachers confessed that they had very little computer experience. Even though it seemed that the respondents did not have much experience, it must be noted that all of the participating teachers had free access to their own computers and most of them admitted that they often used the Microsoft Word program. They also explored the internet in the following manner: Most of them used the internet to obtain information and to help them to research learning material. Equally important however, was social networking and leisure activities. About a third of the teachers used the internet for business reasons. The table below give a detailed analysis of the respondents to the questionnaires.

DEMOGRAPHIC TABLE FOR QUESTIONNAIRE									
DEMOGRAPHIC DETAILS	ASPECTS								
GENDER	MALE	FEMALE							
	5	29							
TEACHING EXPERIENCE	1-5 YRS	6-10 YRS	11-15 YRS	16-20 YRS	21-30 YRS				
	12	7	2	1	12				
AGE IN YEARS	20-29	30-39	40-49	50-59	60-69				
	11	8	8	7					
COMPUTER EXPERIENCE	NONE	BELOW AVERAGE	AVERAGE	ABOVE AVERAGE	EXPERIENCED				
	2	5	16	4	7				
COMPUTER ACCESS	DESKTOP	LAPTOP	NOTEBOOK	TABLET	IPHONE	NONE			
	11	32	1	5	2				
MS OFFICE SOFTWARE	2003	2007	2010						
	0	19	17						
INTERNET USAGE	INFORMA-TION	RESEARCH	TEACHING	LEARNING MATERIAL	LEISURE	FACEBOOK	BUSINESS	ADMIN	DO NOT USE
	32	25	11	24	22	26	9	11	1
MS WORD	RARELY	SOMETIMES	OFTEN	ALL THE TIME					
	3	9	8	11					
MS EXCELL	RARELY	SOMETIMES	OFTEN	ALL THE TIME					
	9	10	9	3					
MS POWERPOINT	RARELY	SOMETIMES	OFTEN	ALL THE TIME					
	15	12	3	1					

Table 4.3: Demographic analysis for questionnaire

The answers to the open-ended questions are summarised as follows.

The purpose of the first question: “What is your primary drive for being a teacher?” was to establish the respondents’ motive for being teachers. They were all moved by their love for children and the drive to make the world a better place by facilitating the development of young people. They saw teaching as a satisfying profession in the sense that it gave purpose to their existence and allowed for quality time with their own offspring. Even though these respondents saw their profession as the creation of a better South Africa, they were not blind to the negative aspects associated with their choice of occupation such as salaries that are not market-related to their qualifications. Overall, it seems that these teachers are outcomes-orientated rather than income-orientated.

The question: “Which aspects of your life as a teacher can be improved?” brought to light the lack of various managerial skills that many teachers experience in their working lives. Time and change management, as well as a more effective administrative- and assessment process are but a few that stood out. They felt that technological aides could possibly help them to address these problems. Other aspects like professional development and specialisation in their chosen field of interest were also mentioned. They requested help in dealing with class discipline as well as organisational management and the need for proper planning. In answer to the question: “In which areas would you like to receive extra training in order to improve your teaching experience?” the respondents expressed the need for extra training in interactive technology and the actual application of the internet to improve the learning material available. They showed a growing concern for the lack of familial care that some of the children in the school experience, leading to the necessity for proper training for teachers on how to provide professional emotional support to the children whom they teach.

When asked: “Why do you think it is necessary for a teacher to be computer-literate?” The participant-teachers, without fail, realised the undeniable value that computer literacy could have to their lives as educators. They agreed that their lives

would be streamlined as far as administrative aspects were concerned and that a vast fount of knowledge would be available to them if they had the ability to utilise the internet to its fullest capacity. They believed that the ability to do their own neat worksheets and other learning material would bring about a much sought-after independence enabling them in turn, to reach their own personal goals.

When thinking about the question: “In which ways can the use of a computer, improve your teaching experience?” they realised that they had to be able to converse in a manner related to the communication methods of the learners whom they teach in order to enable them to act in these learners’ best interest. Many of the respondents also expressed their concern about being able to keep up with their occupational tasks if they do not join the digital age and become computer-literate. In answer to the question: “How do you feel about compulsory training for all in-service teachers?” they stressed, however, that any type of compulsory training should be relevant and worthwhile in dealing with the challenges of their workload.

The following questions were asked about CAPS: "How do you feel about the implementation of CAPS?”; “How is CAPS going to affect the quality of education of future learners?” and “How can on-going CAPS training be facilitated throughout South Africa?”. These questions were included to determine if there were any insights into how an attitude towards technology might be influenced by the introduction of the new syllabus. The only real insight derived from these questions was that teachers are not adverse towards change; they just wish to expedite this change as smoothly possible.

The response to the questions about the new CAPS was generally positive. The respondents stressed however, the importance of on-going training and facilitation in the form of interactive websites. Again, the value of computer literacy and the ability to access the internet were mentioned and many suggested that the provision of compatible software by the government, which could be downloaded, would ease the administration of repetitive assessment.

In answer to the question: “How can the community assist schools in its area in improving the level of education in South Africa?” many of the respondents felt

financial support by businesses would go a far way towards improving the facilities at the local schools. This includes the provision of technology. If this improvement could be implemented, a healthy sense of CSE will be necessary for teachers to learn new computer skills. More interesting though, was the view that there was a need for accountability to be displayed by parents, schools and the government, concerning the quality of teaching and support given to the learners. According to these teachers, parents should be more involved in their children's schooling; they should monitor homework and provide the necessary supplies needed by children to enable the latter to learn most effectively. The participating teachers wished that parents could also promote the value of a good education and teach their children to be more disciplined. This attitude would make the teaching and learning experience much more rewarding for all involved.

The respondents also wanted the community to demand that properly qualified teachers teach their children. They continued, claiming that it was not only the previously disadvantaged schools that employ under- and unqualified teachers, it had become known that male teachers were employed, because they were and still are scarce commodities. According to them, these people were hired, because they could coach sport and not because they could contribute to the academic development of learners.

Through the question: "Which functions does your PC fulfil in your everyday life?" the respondents were asked how being computer-literate could improve their personal life. Many of the teachers use computers for leisure activities like social networking and communication, while others use them for administrative purposes like banking and business. When replying to the question: "In which ways do you use your PC to do your schoolwork?" one understands that they see the real value of computer literacy as instrumental in improving their functions as teachers. They felt that computers gave access to unlimited resources in planning lessons and would allow them to have control over the generation of learning material and to save this for repetitive use. This will simplify and lighten their workload. They believed that visual representation of information to learners would greatly improve the understanding and memory retention of these learners.

Respondents understood that unlimited access to the internet would substantially improve their capacity to teach more effectively. In answer to the question:" How would access to the internet improve your ability to teach?" they supposed that their subject knowledge could be supplemented and that they could learn new teaching strategies from other teachers.

The final question of the questionnaire was: "If you could change one aspect of your work as a teacher, what would that be?" The first thing that comes to mind is the constant unhappiness that teachers experience regarding their salaries: this was however, only mentioned by one percent of the respondents. Their main objection was to the repetitive and unnecessary "red tape" as far as assessment and other official documents are concerned. The respondents declared that they are in need of technological intervention. They experience the lack of computer proficiency as detrimental to their essential role as teachers and facilitators of learning.

The following Likert items were chosen to test the views of the participant-teachers concerning technology (see Appendix C):

- Access to information;
- More effective administration;
- Greater level of accountability;
- Facilitate underdeveloped schools;
- Improve the learning experience of learners;
- Create effective teaching methods;
- Improve academic results;
- Transform information into knowledge;
- Networking with other teachers; and
- Facilitate long distance training.

The scale takes the form of a set of statements to which the respondents had to indicate their degree of agreement on a scale of one to five. The total of their scores would then indicate their overall attitude (Newby 2010:657). This Likert scale was included in the questionnaire to serve as a measure of triangulation confirming the

answers to the open questions given just before it. It can therefore be seen as an affirmation of the respondents' opinions.

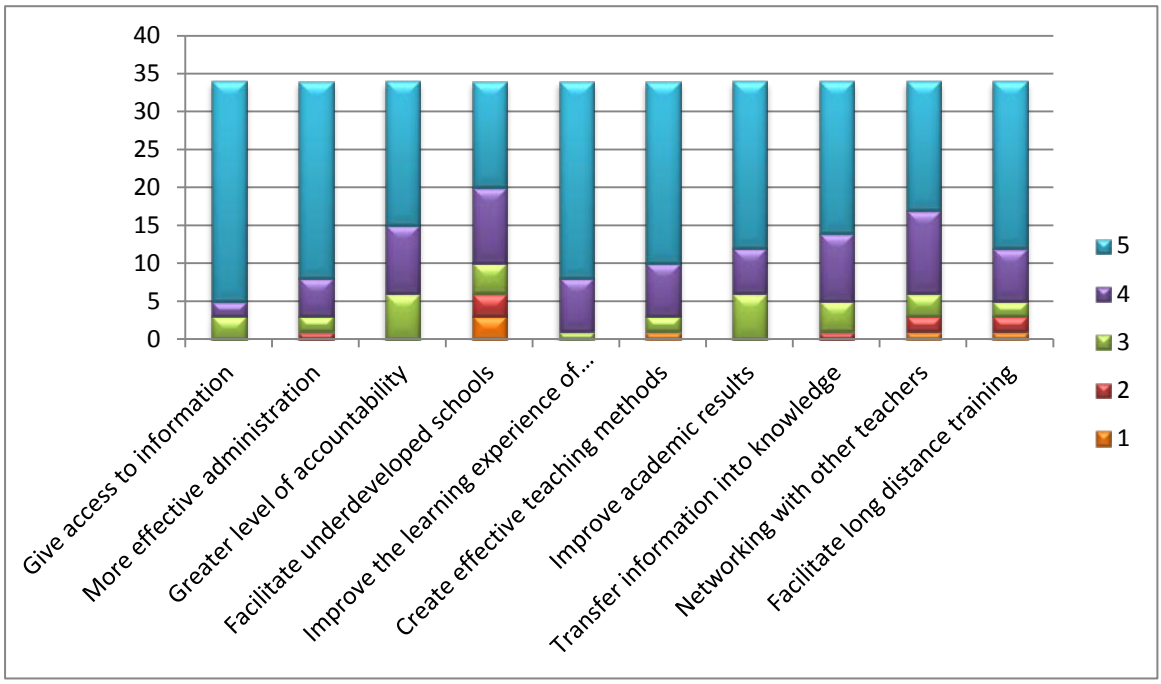

Figure 4.1: Likert scale responses

According to the summary of the Likert scale answers, the following information is pertinent: the foremost reason why the participant-teachers use technology in their profession is to have access to information. The second two statements with which seventy-five percent of the teachers agreed, is that their administrative abilities are enhanced by technology and that the learning experience of learners is improved by the use of technology if it was utilised to create effective teaching methods. The respondents also felt that their personal development could be facilitated through the World Wide Web although they did not feel that technology should be used to create a greater level of accountability to which they should be held. Networking with others and the facilitation of under-developed schools also did not rate very high on their scale of importance. The value of this collected data lies in the fact that it confirms the answers given in the open-ended questions of the questionnaires. This researcher felt that answers to open-ended questions could be interpreted in different ways. The Likert items allowed a limited input and this ensured that this

researcher could confirm the deductions made from the open-ended section's answers.

4.2.3 An observational narrative

An observational narrative is an analysis of the experiences of an individual who is chosen because the life of this individual is typical of the phenomenon that is being researched (Newby 2010:52). The observational narrative of this specific teacher was chosen, because she was like most of the teacher participants who were challenged by technological development and hampered by a limited sense of CSE.

This observational narrative was based on years of interaction with the participant teacher. This study was actually initiated because this researcher realised that a weak sense of CSE, rather than a lack of skills was more to blame for the fact that teachers do not use computers effectively. The participant had confided during a previous study on factors influencing the stress levels of teachers that the lack of CSE was a major source of stress for her. She felt that she had all the necessary hardware available, but did not utilise it due to (in her words) inadequacy. The observational narrative is therefore a story of this teacher's life, rather than a scientific and objective study.

After gaining verbal permission from the participant and giving assurances of anonymity, this researcher wrote down the narrative as it is presented in this section. The value of this narrative is that it provides insight into the inner feelings of a teacher who experienced a weak sense of CSE. The narrative was given to the participant to confirm whether the researcher understood her feelings correctly and whether the conclusions reached were indeed accurate and relevant. After discussing a few aspects and changing some deductions, the participant agreed that this was indeed a true rendition of how she felt.

Firstly, the life of this teacher is described concentrating on technology, teaching and how these two interacted. Then her experiences concerning computers and reaction to these experiences are explained.

The teacher in question qualified as a teacher in her twenties and has been a primary school teacher for the past thirty years. She is an extraordinary teacher, who knows her subject, for example, Languages, and she has a great rapport with her students. She became a teacher, because she believed that it was her calling to work with children and to empower them to reach their full potential. She is an active mentor to the younger generation teachers and she does everything she can to support them in their quest to become the best teachers that they can be. Her colleagues describe her as an attractive, competent and knowledgeable person, who is always prepared to help when needed. She is generous with her praise for the effort put in by her students and acknowledges hard work done by her co-workers.

She recognises the value that a computer network system might have where teachers could communicate with each other and solve problems creatively. She feels that people like her should facilitate under-developed schools by providing help in the form of information, work sheets and examinations. She also feels that distance learning can be very valuable for teachers and that the new CAPS syllabus should be facilitated through interactive websites run by experts in the field, employed by the Department of Basic Education

Although she has mastered many difficult skills (she is an accomplished illustrator and crafter), she is still very overwhelmed by her computer as a working tool. She feels intimidated by software programs like MS Word and MS Excel. Her computer is a state of the art model with all the relevant software necessary and she has uncapped access to the internet. She has participated in a software workshop, teaching her to use Microsoft Word, but still has no self-confidence where her computer is concerned.

She is however, capable of scanning in photos for her art and loves to SKYPE (a program where one can communicate via video feed) with friends and family. This fact is again confirmation that it is not her skills levels, which are in question. The idea of producing working documents, which would be perused by others, is intimidating to her. She acknowledges the importance of being computer-literate and understands the value that this can add to her personal and professional life. She comprehends difficult formula needed to calculate the weighting of assessment and

is the head of the Languages Department of the school. She says that she does not like working with her computer because, according to her, she cannot use it to its full potential. She confesses that she has no problem accessing the websites that she likes, because they are important to her and she is interested in the information they provide. She told the researcher that if somebody at school would help her use the computer she would probably use it much more.

4.2.4 Themes and categories

The focus group interviews gave an insight into how the different generations perceive the use and value of computers in their everyday lives as teachers. The questionnaires consisted of demographical information needed to establish the range of participants who responded. Various open-ended questions were added to allow the respondents to give their opinions, which they generously did and it was followed by a Likert-scale survey to confirm the general state of mind projected by the open-ended questions. Some of the respondents even went back to amend and add to their answers, after the completion of the survey, because according to them, it made them rethink some of their answers given in the open-ended questions. Although the Likert scale survey is not a qualitative research method, it was used here as a triangulative measure to confirm the views expressed in the open-ended answers. It became clear (from the questionnaire), that it was necessary to have an in-depth conversation with one of the respondents, who represents the average teacher, one whose CSE one would like to facilitate. These methods allowed the researcher to triangulate the data collected and to form a clear picture of the available information presented.

After the key words had been identified and classified according to the IPC certain themes or categories emerged from the data collected. The following themes stood out in the analysis of the data: "*Professionalism in relation to computer literacy*"; "*Teaching and how technology influences it*"; "*The value of compulsory computer training for teachers*"; and "*How CSE can be facilitated*".

4.3 DATA INTERPRETATION

4.3.1 Introduction

The interpretation of the data collected enabled an understanding of how computer literacy and proficiency can influence professional development of teachers. It elucidated teaching practices and indicated how technology can influence the success of teaching the digital generation. Compulsory actions forced on an individual cause strong emotional response – mostly negative; the data collected illustrated how teachers felt about computer training in general and specifically related to their professional field. Finally, the information gathered reveals the possibilities of how a robust sense of CSE can be facilitated in primary school teachers in Mpumalanga. The following themes, which emerged from the data collected, are now discussed.

4.3.2 Professionalism in relation to computer literacy

It has become clear during the collection of data in this research and the analysis thereof, that teachers see their occupation as a calling. One can relate to the act of self-actualisation as referred to in Maslow's hierarchy of needs featured in his theory of motivation (Maslow 1943:370-3960). Not only is the inability to develop oneself on a professional basis a threat to the higher needs of self-actualisation and appreciation, it can also be threatening to the basic need for safety in an profession that fulfils these higher needs.

Weiner's attribution theory (see section 2.2.3) illustrates that computer anxiety can be overcome through consideration of attribution. The participants' expectations of successfully utilising computers influence their attitudes towards computer usage as a whole. They may think for example, "Why should I even consider all the advantages that computers can add to my life if there is a good chance that I may not even be able to start my computer without a struggle?" Weiner's attribution theory together with Bandura's SCT (see section 2.2.1) highlights the importance of expectations again and how important it is that any learning programme for adults should keep these expectations in mind if a successful facilitation is to be brought

about. The following paragraph accentuates again the importance of a perceived locus of control, which adult learners revere.

When asked how their lives as teachers could be improved, there was a consensus that the lack of management skills is a huge problem. Aspects such as time management, change management and organisational management stood out and they agreed that having technological aides to help them cope with these challenges would be an advantage. Management courses online could be an effective way to learn these skills. The ability to network with other teachers and to solve management problems in a practical way could also address this problem.

Another fact that also became clear during the research is that computer literacy is essential for the ability to commit to life-long learning for any teacher, and life-long learning is crucial for professional development in this ever-changing world. The aim of this study had been to find ways to facilitate the participant-teachers' CSE so that they are more inclined to become computer proficient and not write it off as an unattainable skill. Sources of SE, and as a result also CSE, include personal mastery (see section 2.2.1.2). Nothing breeds success like success. If a programme could be developed which connects to existing knowledge and allows the new knowledge to be accommodated as illustrated in the theory of constructivism (see section 2.2.6), one can be sure of a measure of willingness of teachers to explore new material and develop related skills.

4.3.3 Teaching and technology

Teaching is an evolving profession. The main objective of a teacher is to connect with his or her learners on an intellectual and inter-personal level and to facilitate the internalisation of knowledge and the development of skills. In order to make this connection with one's learners, one has to be able to communicate effectively and to do this; teachers and learners must speak the same language. For most of the participant-teachers, this reality is of paramount importance and they realise that to be able to communicate with the digital generation, one has to be able to "speak computer". In any assignment set for learners, there are specific criteria according to which this task is assessed. Presentation and information are very important and

have the most pertinent weightings. Computers are used to compile these assignments. A teacher cannot judge the work of his or her students if he or she has not mastered the relevant skills themselves.

According to the data collected, all the respondents had access to computers with the appropriate software installed. They all realised the value of the ability to access the unlimited resources available on the internet. All the respondents acknowledged the value of technology and the ability that they would gain to access unlimited resources in the planning of lessons, generation of learning material and the improvement of their own subject knowledge.

The participant-teachers agreed that the new CAPS syllabus could only be implemented with success, if there was the possibility of on-going training and facilitation in the form of interactive training, manned by experts. The question remains if they will actually make use of this treasure fount of knowledge. The ability to utilise a computer will ease the process of long distance and ongoing training. O'Sullivan and Strauser (see section 2.2.1.3) confirmed that participants with a stronger sense of CSE will set higher goals for themselves, especially concerning the cognitive process of learning a new skill and the utilisation of that skill as far as the teaching process is concerned. They explained it as follows: "If you can imagine it you can do it."

4.3.4 Compulsory computer training

According to Knowles in his theory of andragogy, teachers' positive attitude towards computer training will be greatly influenced by their perception of the usefulness of this kind of training (Knowles 1980:40-59).

As far as compulsory computer training is concerned, Maslow's motivation theory also comes to mind where he states that sometimes, when one is extrinsically motivated to do something and through this action realise the value of the said exercise, this motivation can turn intrinsic and the learning process can begin (Maslow 1979:17).

According to O'Sullivan and Strauser (2009:251-258), SE, and as a result CSE, affect the human functioning in that it plays a key role in people's self-regulation of motivation (see section 2.2.13). If a strong sense of CSE can be facilitated, the learning process will be vastly enhanced. People with a strong sense of CSE will feel sufficiently empowered to take on difficult challenges and their expectations of success will ultimately affect the outcomes of their studies.

Although all participant-teachers agreed that training is important they were all specifically decisive that they would only be interested in doing so if it is relevant and worthwhile in dealing with the challenges of their workload. The younger teachers were adamant that the older teachers should all go to the training as well and that they, the younger generation, were not willing to carry the technological responsibility alone. The older teachers, who were not so fluent in computer work agreed that this would be the sensible thing to do, but still with a feeling of trepidation. It is therefore important that the working memory, as explained in the IPM, connect the new information to existing knowledge (see section 2.2.5). For learning to be successful, the participant-teachers should realise that this new information of skills that they are expected to learn has a basis in their existing frame of reference and will enhance their professional lives. Once these new skills have been assimilated into their long-term memory, these will serve as a link to training that is more progressive: For example, basic computer training, which could lead to the mastery of interactive white boards. New constructs will then be formed through the introduction of new schemes; the allowance of assimilation; and ultimately accommodation (see section 2.2.6).

4.3.5 The facilitation of CSE

Perceived SE is defined as a person's beliefs about his or her ability to bring forth expected levels of performance (see section 2.2.1.1). The term computer self-efficacy is derived from the concept SE and if one wanted to promote a more robust CSE, one should go back to Bandura's teachings (see section 2.2.1.1) on how to encourage a healthier SE. The processes through which self-belief in efficacy can effect human functioning is as follows: *cognitive processes; motivational processes; affective processes* and *selection processes*.

During the *cognitive process*, one can visualise either success or failure (Bandura 1994:73). If one can convince teachers that they will be able to become computer-literate, this may lead to a better chance of success. This could be done by taking into account the difficulties that they are faced with and the demands that their everyday lives make on them. A compulsory training course could be presented to them during the time that they have to be at school anyway (usually an hour and a half after the learners have gone home).

The *motivational process* has to do with that which moves someone to perform certain activities. Motivation can be either intrinsic or extrinsic (see section 2.2.2). The teachers in the research realised and acknowledged how valuable computer literacy would be for them. The fact that they understood this, put the intrinsic motivational process on the right path to success. It actually became clear that without a measure of extrinsic motivation few of the less computer-proficient candidates would not challenge the *status quo*. Figure 2.2 describing the taxonomy of extrinsic motivation allows for four levels of extrinsic motivation: external regulation, introjection, identification, and integration. External regulation has to do with external punishments and rewards. This type of extrinsic motivation is possibly the only way to persuade a participant with a weak sense of CSE to attend any type of computer training. Because of the fleeting nature of this type of motivation, one cannot expect this learning programme to be successful at all. The ideal would be to facilitate the development of a robust sense of CSE, where the locus of control would become internal. A healthy CSE allows the participant to identify valuable activities such as being computer-proficient and that this will lead to self-actualisation (see section 2.2.2). Even though one cannot surmise that extrinsic motivation will develop through stages and morph into intrinsic motivation, one can still see the value of *integration*, which is certainly congruent with self-actualisation needs.

According to Bandura (see section 2.2.1), people who believe that they have the ability to exercise control over threatening situations, do not as a rule, conjure up negative thought patterns. In these *affective processes*, control is a major player in regulating those thoughts producing stress and depression. One could allow the teachers of the school a reasonable period in which to complete the computer

courses necessary. This would also regulate the training process, allowing the facilitator to have a limited number of teachers to train. This in turn could provide a much more personalised experience for the trainees as well.

The last process mentioned by Bandura (see section 2.2.1) is the *selection process*. This process is about the choices people make and the environments in which they select to live their lives. If the environment can be managed in a much more sensible way after they have gone through computer training, it might be easier for them to choose to do the computer training. This would help them to fit into the working environment more effectively. If technological aides could be installed in classrooms and internet access provided, teachers might realise that it is in their best interest to be computer-literate. When they start to use these aides on a daily basis, their sense of CSE will improve and grow.

4.5 CONCLUSION

In this chapter, the presentation of the collected data was set out and the analytic process was explained. The researcher analysed all evidence collected through each data collection process. The following information became known.

The focus groups showed a distinct difference in the fact that the first focus group, who had more professional experience and less technological experience found ways to deal with the situation by being dependant on others who could help them cope with the deficiency. They realised that they would have been able to manage their time far better if they were more proficient where computers were concerned. The group who had less professional experience saw computer proficiency as a given, and they regarded the computer as an essential tool to deal with the fact that they had to repeat work constantly in order to comply with professional demands. The prescriptive nature of the new CAPS syllabus and the calculations necessary to comply with the assessment procedure introduced technology as a valuable teaching instrument; worksheets with formula to do the calculations would be welcomed by both the focus groups. The majority of the participants in the focus groups welcomed compulsory computer training – those opposed were on the verge of retirement and could not fathom what the value that this would have for them. The fact that some

participants in the focus group with the higher professional experience were not eager to go on computer training could be because of a weak CSE. They have a certain image of being sagacious and they are afraid that the effort that would be invested in learning these new skills may not bring about the outcomes needed to be successful. Vicarious experiences could remedy these fears if they would just consider trying to learn with peers.

The questionnaires revealed that the respondents had a variety of professional as well as technological skills. The respondents acknowledged that they used computers for various reasons, mostly recreational. With the exception of one or two individuals, all respondents believed that being computer proficient would vastly improve their working conditions and time management. This belief is a cornerstone for the facilitation of a healthy CSE and therefore very encouraging for a successful outcome. They professed high outcomes expectations where computer proficiency was concerned and the lack of a healthy CSE was the main reason why they felt inadequate in dealing with technology. The interesting fact is that this uncertainty was not limited to the older generation but applied to all concerned. This could indicate that the learning programme for teachers should concentrate more on calculation worksheets to accommodate the new CAPS assessment weighting system. All the respondents agreed that teaching and technology are conclusively entwined if one wishes to teach the digital generation. Compulsory computer training is regarded as a necessary but unwelcome element. The fact that the respondents know that they need computer training but feel reluctant to actually undergo the training is again an indication of a less than robust CSE.

The observational narrative about the one teacher’s life is illustrative in the sense that her life mirrors that of many others. She is a highly trained professional who believes that computer proficiency will greatly improve her day-to-day challenges. She knows that learning a new computer software program will improve her working conditions exponentially, but still feels quite vulnerable if she thinks about the magnitude of this feat. She was one of the first teachers to attend technology seminars and the researcher overheard her telling the presenter that she would appreciate it if he could do a presentation of the new interactive whiteboard at her

school. This enthusiasm is however not enough, because of a low sense of CSE she feels very intimidated by even the entry-level programs.

This researcher has concluded that the teacher-participants who assisted in gathering this data were professional and enlightened. They agreed that those proficient in technology are the gatekeepers of the future. They acknowledged that need for computer training and saw it as essential for their professional development. However, some of the participants had a strong enough sense of CSE to embark on the technological development journey. This again accentuated the urgent need for the facilitation of CSE in teachers all over the country. (This facilitation is discussed in detail in Chapter 5).

The data provided therefore provided certain patterns and the researcher discussed these finding under the headings: *Professionalism in relation to computer literacy; Teaching and technology; Compulsory computer training;* and *The facilitation of CSE*.

Chapter 5 summarises the literature research, as well as the empirical study performed. The findings, which the researcher made throughout the study, are summarised and conclusions are made on these findings. Contributions to the knowledge base of this field are mentioned and recommendations for further research are made.

Chapter Five: Summary, conclusions and recommendations

5.1 INTRODUCTION

Chapter 4 focused on the presentation of the data collected, the data analysis and interpretation of the data. The research problem was about finding ways in which to facilitate a healthy sense of CSE in primary school teachers. Through the analysis of the data, certain themes emerged. These were as follow; the effect that computer proficiency may have on professional development; ways in which technology can enhance the art of teaching; how teachers regard compulsory computer training; and finally how a lack of a robust sense of CSE can endanger the positive prospects of the above themes.

In this chapter, the researcher summarises of the findings of the literature review and the empirical study. The researcher mentions the limitations that were encountered and the conclusions reached through this study. The researcher finally makes recommendations concerning how to solve the problem of CSE facilitation of primary school teachers.

The study intended to identify factors that will help facilitate a robust sense of CSE in primary school teachers. The researcher also wished to establish the participant-teachers' current range of technological skills, and to understand which computer skills are necessary to improve these teachers' CSE. The following questions needed to be answered as part of the research process:

How can a robust sense of CSE in teachers be developed in a South African primary school?

Following from the main question, and to gain a better understanding of the situation, the following sub-questions were addressed:

What is the present state of teachers' CSE in a South African primary school in Mpumalanga?"

What computer technology skills do primary school teachers have?

How can computer skills be cultivated so that these may enhance teachers' CSE?

5.2 SUMMARY

5.2.1 Introduction

In the following sections the literature review as well as the empirical study are summarised to provide a basis from which to understand the conclusions and recommendations.

5.2.2 The literature review

This section consists of a summary of the literature review drawn up to establish a theoretical base for this research (see section 2.2).This theoretical base includes the theories on SE, motivation and adult learning as well as the learning theories of information processing and constructivism. A South African background of the role of technology in the lives of teachers was highlighted (see section 2.3).

The results of the literature review are discussed under to the following headings:

- The theoretical framework; and
- Research on the role of computers in teaching.

5.2.2.1 The theoretical framework

Theories studied were Bandura's construct of SE (1994), Maslow's motivational theory (1943), Weiner's attribution theory (1985) and Knowles' theory of andragogy (1980).The learning theories of information processing (1950) as explained by Schraw and McCrudden and Piaget's constructivist perspective (1980) reintroduced by Ozer (2004) illustrate the way people learn. The theoretical frame of reference established, brought insights set out below.

Efficacy in dealing with one's working environment is not fixed, or just a matter of knowing what to do. It is rather one's perception of being able to perform up to the standard required to do one's job to specified standards (see section 2.2.1).The development of a healthy sense of SE can cultivate the intrinsic motivation necessary for adults to learn new skills. Bandura (see section 2.2.1) also mentioned that most of the things that adults enjoy doing for their own sake had little interest for them to start with, but then through the appropriate learning experiences these activities could become imbued with consummate significance.

A weak sense of SE is not limited to inhibiting a person's ability to accomplish certain tasks. It can also be detrimental to individual's psychological well-being. If a teacher has a strong sense of SE, failure can be regarded as a challenge rather than a threat. The review introduced several sources of SE such as *mastery experiences; vicarious experiences; social persuasion;* and *emotional arousal* (see section 2.2.1.2). *Mastery experienced* is the success that one accomplished in life. It is important however, that success does not come easily, because this will diminish the value it presents to the participant. Most people feel that only things that one has to work hard at have value. *Vicarious experiences* are those successes that others like oneself, accomplish. If a person that one can relate to experiences success, the chance is good that one may also be able to conquer these challenges. *Social persuasion* is an integral part of any mentoring programme. If a person, regarded as being important to the participant, believes that the participant will succeed, the chances of success will be enhanced because the mentee respects the opinion of the mentor. The final source: *emotional arousal* has to do with the wonderful feeling of accomplishment one experiences when achieving success (see section 2.2.1.3).

There are four key processes through which SE can influence a human's ability to function effectively. The first, the *cognitive process*, is a process regulated by the intellect. If a person can reason how something works, he or she should be able to utilise it. The second process is *the self-regulation of motivation*; this includes causal attribution, outcomes expectations and cognised goals. With causal attribution, the reason for success or failure can be searched for either intrinsically or extrinsically. With a healthy SE, a person would think that he or she must just work harder to

succeed; however, someone with a weak SE will regard the task as being above his or her ability and give this as the reason why he or she does not succeed. Outcomes expectations are the expectations that people have that, through the performance of certain actions one could expect specific outcomes. This leads to the third process, the *affective process*, where people, with a healthy sense of SE, tend to set challenging goals for themselves, because they are sure that they will be able to succeed (see section 2.2.1.3). The final process, the *selection process* is a process through which people with a strong sense of SE create beneficial environments in which they can thrive. The concept of goal setting and the creation of beneficial environments interlinks with Maslow's motivational theory, which highlights the value of intrinsic motivation in adult learning (see section 2.2.2).

Maslow understands that humans are motivated to act in certain ways by their needs. He differentiates between higher order needs and basic needs. Basic needs are related to extrinsic factors such as safety, survival and the affection of loved ones. The higher order needs are intrinsically motivated. They are related to acceptance by peers, accomplishing goals and finally the more spiritual self-actualisation. There is a very fluid development and interaction between activity and needs on a daily basis in the lives of all active adults. This leads to how adults attribute success and failure.

Weiner (see section 2.2.3) stated that adults attribute success or the lack thereof, to certain causal explanations embedded in specific dimensions: if the locus of causality and control can be internalised, there may be chance of developing and nurturing a healthier CSE within teachers lacking this personal skill. Attribution theory describes how people explain their experiences and the outcomes of their efforts. This focus must be in agreement with the previous findings regarding learning experiences and how this new information would contribute to the existing knowledge base developed by the adult (Stajkovic & Sommer 2000:79).

This theory led to the need to find out how adults learn and why they learn differently from children. Knowles' theory of andragogy (see section 2.2.4) determined that adults' manner of learning has the unique quality of self-direction. Adults believe that the cause of their success or failure lies within themselves, so if they fail, they have

to improve themselves to change their circumstances. The adult learner wishes to add to his or her knowledge base intentionally and by understanding the cause of certain actions, he or she can control the learning process to such an extent that it improves his or her working conditions and overall value to society. This can again be linked to the top echelon of Maslow's hierarchy of needs, that of self-actualisation.

The learning theory of information processing explains how people experience new information and how one should go about ensuring effective coding when planning a learning programme. Practice makes perfect - for effective coding and retrieval to take place, one should allow for rehearsal and drilling exercises (see section 2.2.5). The constructivist perspective reminds facilitators again not to underestimate the value of the existing knowledge base that adults have already accumulated (see section 2.2.6).If new information can be used to develop intricate schemes through assimilation and accommodation, permanent learning can take place. These new computer skills will enhance CSE, which in turn will lead to self-regulated motivation to learn even more.

Constructivist theorists believed that learning takes place when experience brings about a change of meaning. Adults who experience a weak sense of CSE regard computers as a threat. This meaning connected to computer usage should change through the acquisition of computer skills. The computer should be seen as a learning tool and an aid rather than a threat. The learning programme facilitator should keep in mind the uniqueness of the way that adults learn, when choosing teaching methods. These methods should accommodate the interactive process between instructor and learner. Adults have experience in their field of expertise and their knowledge base must be considered when teaching them new constructs. Many of these adults have good management skills. The learning process will be more successful if adults can be convinced that computers are mechanisms facilitating mutual planning, organising and control of the learning process (see section 2.2.6).

5.2.2.2 Research on the role of computers in teaching

It was found that teachers regard computers as positive as long as they are useful. If they see technology as advantageous, teachers would definitely include it in the learning and teaching process with great enthusiasm and effectiveness. These studies warn however, that computer proficiency is necessary to create this positive symbiosis. Training is therefore essential if a positive attitude towards computers is to be retained (see section 2.3).

Through this review, a knowledge base was established from which the empirical study was launched. This study was conducted to find ways to facilitate the development of a robust CSE of teachers in a primary school in South Africa.

5.2.3 Summary of the empirical study

The literature review was done to establish a knowledge base from which the researcher could start to plan the choice of research design and determine the rationale for the empirical research. The researcher attempted to answer the research questions by mostly using qualitative methods. As a quantitative method was also applied, the study became in essence a mixed-method research design (see section 3.3).

The research aimed to find ways to facilitate the development of a strong sense of CSE in primary school teachers. The researcher also wished to identify the level of technological proficiency that already existed in this school and establish the computer skills needed to improve these teachers' sense of CSE.

The participants consisted of three groups: two focus groups; respondents who completed a questionnaire; and finally, a single participant who contributed to an observational narrative.

Firstly, the focus groups were purposefully selected to illustrate how two groups with different ages, work experience and computer proficiency levels experience CSE (see section 4.2). Two interviews, (see Appendix B) consisting of the same questions were held with these groups. The respondents varied on a biographical level as well

as the level of experience and computer proficiency (see tables 4.1 and 4.2). These focus groups gave the researcher some insight into how different generations perceive and experience computer proficiency and how this in turn can influence their sense of CSE.

The data collected from the transcription of these interviews was then used to compile a longer questionnaire (see Appendix C). These questionnaires were completed anonymously to allow the respondents the freedom of expression. Biographic information was requested to place the answers in context (see table 4.3). This was followed by a set of open-ended questions, which encouraged the respondents to give their insights concerning computer proficiency, work stressors and where they placed the value of CSE and being computer-literate. To close the questionnaire a quantitative method, (a brief survey), was employed to confirm the meanings taken from the open-ended questions before (see figure 4.1). Although this was not a qualitative method, it was used to obtain confirmation of the information deduced.

Information pertinent to the study, which emanated from the questionnaires, was as follows: these teachers are moved by their love for the youth of South Africa. Stressors experienced, were mostly concerned with time and administration management, as well as the challenge of compiling effective study material for their learners. The respondents all agreed without exception that being computer-literate is essential if they wish to handle their professional lives more efficiently. They felt that the Department of Basic Education should provide training related to the administration of assessment. They agreed that mentorship should be the answer to learning any new skill – even teaching strategies.

The observational narrative was about the life of one of the participant-teachers, because she represented the teachers of this school who experienced a weak CSE. She also had the quality of someone who realises her shortcomings and who is prepared to work on them. She would be an ideal candidate for in-service training, because she is smart and willing to learn.

The themes and categories, which emerged from this study, can be summarised as follow.

Professionalism in relation to computer literacy surfaced as an interaction between the motivation of teachers to provide a meaningful service to their learners and the challenge of having to become more computer proficient (see section 4.3.2). This interaction causes stress if the teachers experience a weak sense of CSE and a challenge if the participant-teachers experience a strong CSE. They realise that networking with other teachers can be very rewarding which introduces the next theme, that of teaching and technology.

Teaching as a profession has to grow with the surfacing of new facts and methods every day (see section 4.3.3). Technology is not only a new entity, that has to be included in their knowledge base, it is a gateway to other new information necessary to provide a well-rounded education to learners.

Compulsory computer training develops as a theme from teaching and technology, because the teachers should stay abreast of new information. Teachers therefore have to become students to learn more (see section 4.3.4). The participant-teachers were prepared to go for training. They would not mind its compulsory nature as long as the training was useful to their profession.

The final theme that originated from the data collected was the issue of *CSE facilitation* (see section 4.3.5). It is not enough to understand and applaud the need for computer proficiency. Teachers must feel that they have the necessary abilities to behave in such a way as to become successful when dealing with technology. Success or failure is influenced by the visualising thereof and teachers need to be lead in such a way as to see a successful outcome as a real possibility.

5.3 RESEARCH CONCLUSIONS

The following deductions are presented as answers to the research questions. The sub-questions are addressed first, and finally the main research question is answered as an overall conclusion.

What is the present state of teachers' CSE in a South African primary school in Mpumalanga? Many teachers have adequate computer skills, but this does not necessarily lead to CSE. Available computer training programs are not designed to accommodate teaching administration and there are no software developed to administer assessment as it is now determined by the new Curriculum Assessment Policy Statement (CAPS). The state of CSE is not robust at all even for those teachers who had computer training as part of their educational programme. Teachers believed that being computer-literate is important, but they were adamant that they would only be interested in learning more computer skills if these were relevant and worthwhile for them to incorporate these skills in their professional development programme

What computer technology skills do primary school teachers have? Teachers who were trained more than ten years ago do not have computer training as part of their learning syllabus. Those teachers who did receive computer training do not regard it as effective in their everyday working process. Many of the participant teachers do have some measure of basic computer training. They taught themselves in order to be more independent. This is a good omen for the possibilities of establishing the facilitation of CSE, because they seem to be open to the possibility of bettering themselves in order to be more self-sufficient.

How can computer skills be cultivated so that these may enhance teachers' CSE? Research has shown that, in order to cultivate new skills, mentoring programmes should be implemented in schools, where those, who are uncertain of themselves, can learn in a safe and accepting environment. Acknowledgement, through incentive bonuses at the end of the year, should be given to teachers who had gone the extra mile. Through the intervention of school management, teachers who completed the training successfully could have access to more advanced technological aides. Many teachers are intimidated by supporting technologies such as proximas or interactive white boards, until they are assured of ample training before it is expected of them to utilise these instruments on a daily basis.

The main research question for this study is:

How can a robust sense of CSE in teachers be developed in a South African primary school?

One should go back to the main sources of SE and apply this to the development of a process to develop a healthy sense of CSE among these teachers (see section 2.2.1.2). These sources are mastery experiences, vicarious experiences, social persuasion and emotional arousal. These sources are discussed in detail under the recommendations (see section 5.4). Computer software learning programs should be designed to address the specific needs of the teaching profession as it is developing in South Africa to streamline assessment guidelines and standardise the level of expertise displayed by teachers throughout the country. However, the development of computer-software must be accompanied by proper training and ongoing maintenance of computer facilities to ensure computer proficiency and as a result, a strong sense of CSE. A more detailed plan of action is discussed in the following section 5.4.

Flowing from the answers given to the research questions, the researcher wishes to make the following recommendations on how a healthy sense of CSE can be developed in teachers.

5.4 RECOMMENDATIONS

The introduction of computer training programs directed towards the needs of teachers in general is necessary for the facilitation of a healthy sense of CSE.

For this reason, the researcher would recommend that the Department of Basic Education should invest in an in-service teacher training programme. This study has shown that computer proficiency is essential when endeavouring to nurture a robust CSE. Motivation for the implementation of these programmes can be set as part of the new CAPS programme, which has now been introduced.

The learning programme designed to deliver these skills should, however, be compiled in such a manner as to appeal to the teachers as adult learners.

This research found that there is a definite need to be more computer proficient. The lack of computer proficiency leads to a weak sense of CSE. It is very important that adult learners connect a specific value to the learning content and that the content of the learning programme should make sense to these prospective learners.

The next step would be to identify human and material resources for learning. Knowledge is universal, but learning is a unique and personal experience. The concept of “Train the trainer” has value here. This concept refers to the Unit standard Title: Facilitate targeted skills development: Registration No. 9956. This SAQA standard teaches individuals on how to transfer knowledge gathered through an ongoing process of training. For example, the Department of Basic Education identifies educational specialists on a provincial level, who will be trained in the application of the new software program. These specialists will then train a teacher from every school in their area. These teachers should show a certain aptitude for computer work. The trained teachers are then targeted with the task to teach their colleagues the intricacies of the software concerned. This training could serve as the particular teacher’s extra-mural activity, which is ordinarily something like coaching a sport or supervising a cultural activity. The management of the school should provide ample access to technology through open access to the internet and a computer with interactive whiteboard in each of the classes of those teachers who completed the training successfully. As part of further research possibilities, a buddy system could be developed where a qualified and experienced teacher could provide host lessons to underdeveloped schools.

CSE is a perceived self-efficacy concerning computers. If one wishes to develop a strong sense of CSE, one should refer back to the sources of SE.

One of the sources of SE is having a vicarious experience. It is therefore fair to conclude that if a fellow teacher has absorbed a software program, there is a good chance that other teachers will perceive it possible for them to master this program. The training programme can be implemented by the “trainer teacher” in such a manner as to create an environment, which is inductive to learning. This can be in the form of relaxed learning sessions with a strong mentoring undertone.

As a next step, a learning strategy should be chosen and implemented. The fact that adult learners are self-regulated and realise that they have a mentoring role to fulfil once they have learned a new skill will give this type of training momentum.

The most effective way to develop a healthy sense of SE and therefore CSE is personal mastery. Every teacher who has mastered this programme will feel less threatened by computers and more at ease with entering the world of information technology. This emotional arousal will lead to a stronger sense of CSE and will increase confidence to be more intrepid when dealing with IT.

As a final step, one should evaluate the learning programme. By enlisting regular feedback from the schools involved, a measure of evaluation can be applied to ensure that training is done in such a manner as to lead to a successful conclusion.

The Department of Basic Education should create a platform where teachers can ask for help and support when dealing with technology. Computer training should be accommodated in such a way for teachers that their sense of CSE could be improved and strengthened in a practical and effective manner.

5.5 CONTRIBUTION

The contribution that this research may have made to the field of CSE, in relation to educators, is that computer training should be teacher-orientated and tailor-made to address their needs. Computer proficiency is necessary to facilitate a healthy sense of CSE. If software programs are designed to enhance teachers' working conditions they will be more inclined to undergo training. If teachers were more proficient in using their computers, they would as a result have a more robust sense of CSE.

5.6 LIMITATIONS

The participants in this research are typical of teachers of a former Model C school where the members of staff have reasonable access to technology. Although teachers' need for CSE is universal, this research did not attend to the severity of contextual problems as experienced in the majority of South African township and

rural schools. It is possible however, that this study could serve as a pilot study related to other schools in South Africa.

5.7 SUGGESTIONS FOR FURTHER RESEARCH

In the story “A Scandal in Bohemia”, Sherlock Holmes suggested that it is a capital mistake to theorise before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts (Doyle 1892:4).

This again cautions researchers that even though a concept like CSE exists, one should study the phenomenon much more extensively before a theory concerning this technological occurrence could be developed. This researcher believes that further investigation could be done on how CSE could be facilitated throughout the whole spectrum of South African teachers. The answer to this could influence the compilation of much more effective learning programmes as far as teacher education is concerned. As mentioned under section 5.4, further research could be done into the establishment of “buddy” schools. This would be an interactive exercise between a well-developed school and an underdeveloped school. Both the schools in question would have interactive whiteboards, as well as sound systems. This type of lecturing is provided to improve the quality of teaching throughout South Africa. The experienced teacher would serve as a teaching resource and mentor to the inexperienced teacher and the learners would receive a quality education.

5.8 CONCLUDING REMARKS

The learning process in schools rests squarely on the shoulders of the educators. These educators should embrace the changes and evolution that is brought about by new educational software and they would, if they understand the value that this would add to the learning experience. By facilitating their CSE, one would ensure that teachers would have the courage to embrace educational technology. Technology has value, but this research was motivated by the wish to impart understanding and knowledge, to construct learning communities and create a nation of effective learners and teachers embracing professional conduct in schools. These are the crucial accountabilities of all educationists.

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Appendices

APPENDIX A: INFORMED CONSENT FORM

Informed consent form to participate in a research study

This is an invitation to participate in the research study presented as a Dissertation of Limited Scope: "How can Computer Self-Efficacy be developed in a South African primary school?" done by Yolande La Cock. This research project is to be submitted in partial fulfilment of the requirements for the degree of Master of Education with specialisation in Adult Education through The University of South Africa. My supervisor, Dr G van den Berg, is available for any explanatory information concerning this study. Her number during office hours is 012 429 4895.

Involvement

If you agree to be part of the research study, you will be asked to join a focus group interview, fill in a questionnaire and you may be part of an in-depth case study.

Although you may not directly benefit from being in this study, you will be instrumental in developing methods to enhance the lives of teachers throughout South Africa through effective professional development. Participation in this study is voluntary. Even if you decide to participate now, you may change your mind and stop at any time.

Risks and discomforts

There are no risks associated with this study because the data collection is completely anonymous and the topic is not sensitive.

Confidentiality and anonymity

We plan to publish the results of this study, but will not include any information that would identify you. There are some reasons why people other than the researchers may need to see information you provided as part of the study. This includes organisations responsible for making sure the research is done safely and properly, including the University of South Africa.

By signing this document, you are agreeing to be in the study.

I, _____agree to participate in the study.

_____ _____

Signature Date

APPENDIX B: TRANSCRIPTION OF THE COMMENTS OF THE FOCUS GROUPS

TRANSCRIPTION

Inleiding

Ons is vandag hier by mekaar om te gesels oor informasie tegnologie en die onderwys. Die navorsing word gedoen om te bepaal hoe onderwysers voel oor die gebruik van rekenaars en ook om hul behoeftes ten opsigte hiervan te bepaal.

Vraag Een: Wie het toegang tot 'n rekenaar by die huis en by die werk?

Fokusgroep Een	
A	Ons het 'n desktop by die huis vir almal se gebruik. My man het 'n laptop wat ek kan gebruik.
B	Ek en my man het elkeen ons eie laptops. Die kinders is op universiteit en werk al - hulle het hule eie rekenaars.
C	Ek kan my man se laptop gebruik.
D	Dieselfde by my.
E	Daar is 'n rekenaar by die skool wat ek kan gebruik, my vrou gebruik die laptop vir haar studies - sy is 'n verpleegster.
Fokusgroep Twee	
A	Ek het my eie laptop.

[Almal stem saam dat dit by hulle dieselfde geval is].

Vraag Twee: Hoe en waar doen julle skoolwerk soos voorbereiding van werkkaarte en toetse?

Fokusgroep Een	
C	Ek kan my man se laptop gebruik en dan met ‘n memory stick by die skool kom print.
D	Dieselfde by my.
E	Meesal skryf ek met die hand en die sekretaresses tik die werk vir my.
F	Ek skryf alles wat ek wil doen met die hand en laat die sekretaresses dit tik.
Fokusgroep Twee	
A	Ek doen my werk by die huis en bring dit op 'n memory stick skool toe, want die sekretaresses moet dit op hul rekenaars ook save.
[Almal stem saam dat dit by hulle dieselfde geval is].	
C	Ek print alles by die skool want ek gaan nie my eie printerink vir

	skoolwerk gebruik nie.
[Almal stem saam dat dit by hulle dieselfde geval is].	
E	Ek skryf alles nog uit want die sektretaresses moet dit tog op hulle rekenaars sit en die persoon saam met wie ek werk is taamlik puntenerig oor formaat en so aan.

Vraag Drie: Hoe beïnvloed jou toegang to rekenaars jou lesbeplanning en jou administratiewe werk?

Fokusgroep Een	
A	Ek het klaar uitgewerkte lesse wat ek elke jaar gebruik. Met CAPS gooi dit 'n bietjie 'n spanner in die works - maar nou weer van voor af toetse en eksamens uitwerk vir die nuwe werk waaroor die kinders eksamen skryf.
B	Ek hou niks van roetinewerk nie. Probeer interessante goed vir die kids in die hande kry - anders ruk hulle hand uit as hulle verveeld raak.
D	Wel ek dink CAPS moet maar by my aanpas, so ek gebruik my bestaande werkkaarte. Dis met die hand geskryf. Ek pas net die punte aan by die CAPS weighting (Daar is bepaalde gewig van belangrikheid wat deur die CAPS beleid bepaal word bv. 30% gaan vir lees; 20% begrip; 15% mondeling en 35% vir taalwerk).

C	Ek volg maar die CAPS sillabus in die handboek wat deur die skool aangekoop is. Ek is nie regtig lus vir nuwe goed uitdink nie, want hulle herontdek die wiel elke vyf jaar! Ek skryf in elkgeval alles uit en gee dit vir die sekretaresses om te tik.
E	Ek gee Wetenskap en alles is nou verander, want Tegnologie is nou deel van my sillabus. Daar is twee jonger ouens wat die werkkaarte opstel - ek check net dat die inhoud en hulle moet maar werkkaarte opstel.
F	Wat is CAPS? [lag] Nee wat! Met Wiskunde gaan dit maar aan soos altyd - puntetoekenning word wel aangepas om te strook met die nuwe beleid se voorskrifte.
Almal stem saam dat hulle nie veel aangepas het vir OBE nie en dat CAPS maar weer terug is by die ou sillabus se inhoud.	
Fokusgroep Twee	
A	Ek gee Afrikaans saam met een van ons ouer vroulike kollegas. Sy steur haar nie veel aan die werk nie - en ek moet alles doen. Ek gee ook SW saam met een van die jonger manlike kollegas - hy het nie veel ondervinding nie en het sy hande aan die saligheid belowe, ek moet alles vir hom met 'n lepel ingee. Hy kan darem rugby afrig!

B	Ons werk maar volgens die CAPS handboeke - dis baie voorskriftelik - die tyd wat jy moet spandeer aan elke aktiwiteit word selfs uitgestippel! Ek gebruik wel my rekenaar om toetse en eksamens op te stel - ek moet dit voorê aan een van ons senior kollegas en sy verander dit die hele tyd. Sy het eenkeer 'n vraag reggemaak en toe ek dit weer voorlê, het sy dit weer terug verander na wat dit was. Die rekenaar help nogal om tyd te bespaar met hierdie yo-yo situasie!
[Almal lag]	
E	Ja, ek gee Wetenskap saam met een van die ou toppies en moet al die nuwe werkkaarte opstel vir CAPS (als moet vertaal word en hy kan nie juis Engels praat nie). Hy dring egter daarop aan dat alles by die sekretaresses ingehandig word, so ek skryf maar meeste van die goed met die hand uit en handig dit net in by hulle.
F	Ek werk volgens die CAPS handboek en copy memos daaruit. 'n Goeie dag by die skool is een waar ek nie in 'n klaskamer hoef te sit nie - jy weet 'n gesonde liggaam en 'n gesonde gees!
[Almal lag]	
D	Ja, Landi, ek gee ook maar werk vir die sekretaresses om te tik want die rekenaars tot ons beskikking is maar min. Die probleem is, dat hulle 'n week voor die tyd die tikwerk wil hê en dit kramp 'n bietjie my inisiatief - maar die werk moet gedoen word.

Vraag - En die administrasie?	
A-E	Ons moet in elk geval alles op vorms invul met die hand en dan weer oorskryf op ander vorms. Rekenaars is dubbel werk.
E	Ek lees al my punte in op die laptop - maar moet ook die vorms invul.
[Iemand uit die groep - Ja, jy skryf so lelik dat jy nodig het om te tik sod at jy jou eie handskrif kan lees! Almal spot hom goedig].	

Vraag 4: Dink julle dat onderwysers wat reeds in diens is vir meer as vyf jaar behoort verpligte rekenaaropleiding te ontvang?

Fokusgroep Een	
B	Ja wat, maar dan moet hulle vir ons leerplanspesifieke sagteware gee, sodat ons ons punte daarmee kan inlees en net die finale vorms met punte en verwerkings kan uitprint. So kan ons baie van die admin vryspring - Ek spandeer te veel van my tyd aan dubbel admin - dit maak my siel dood!
A	Ek stem saam, moenie laat ons dubbel werk doen nie - ons moet slimmer werk, nie harder nie!
D	Nee wat, ek skryf liewer met die hand - ek wil nie nou nuwe

	goed leer nie.
E	Nee, ek stel nie belang nie. [bot]
F	Ek weet van rekenaars niks nie - ek sien darem mooi foto's van die kleinkinders! [lag]
C	Ek sal dit probeer, maar ek is maar 'n bietjie agter met die tegnologie! Miskien moet die jonges 'n bietjie hul brood verdien - ek moet hulle die hele tyd akademies mentor - so kan hulle 'n bietjie terugploeg!
Fokusgroep Twee	
A	Bedoel jy soos MS Word en so aan?

Vraag: Ja, en ook miskien sagteware vir die Departement se verpligte administrasie?

A	Wel, ons moes almal MS Office doen as deel van ons sillabus op universiteit, so ek wil nie weer daardeur suffer nie, asseblief!				
[Almal stem heelhartig saam].					
A	Maar, as daar sagteware is om punte te verwerk is ek ten gunste daarvan. Ek sal op die ou end wel almal se punte wat saam met my werk moet inlees, maar ten minste verseker dit eenvormigheid en kan so 'n gemors uitskakel!				

E	Ek stem saam - dit gaan ook my werk wees want my kollega is allergies vir 'n rekenaar!
F	Sal my pas, want dan doen ek nie dubbel werk nie.
C	Ek hou van die idee, maar almal moet dan gaan vir opleiding, nie net die jonges nie. Ek gaan nie ander mense se werk dien nie, ek het genoeg werk van my eie - Ons moet ook al die sport doen - ek gaan nie my ouer kollegas se admin ook nog vir hulle doen nie! [taamlik vurig]

Afsluiting

Baie dankie aan almal wat deelgeneem het aan die bespreking! Die doel met die fokusgroepe was om julle opinies te hoor en ook om uit te vind watter vrae gevra behoort te word ten opsigte van tegnolgie en die rol wat dit speel in die beroep, onderwys. Ek wil julle weereens verseker dat julle identiteit absoluut geheim gehou sal word in die analise van die data wat ingesamel is. Baie dankie!

APPENDIX C: QUESTIONNAIRE FOR CSE RESEARCH

QUESTIONNAIRE

The following questions will help to define the perceptions that teachers have regarding the use of computers and how their IT needs can be facilitated.

Please note that this questionnaire is completed anonymously and information gathered is regarded as absolutely confidential.

First a few biographical facts: (Please tick the appropriate block – you may tick more than one.)

Gender					
Male	Female				
Years of experience as a teacher					
1-5	6-10	11-15	16-20	21-30	
Age in years					
20-29	30-39	40-49	50-59	60-69	
Computer Experience					
None	Below average	Average	Above average	Experienced	
Do you have a computer at home?					
Desktop	Laptop	Notebook	Tablet	Iphone	None
Which MS Office software programme do you have on your PC?					
MS Office 2003	MS Office 2007	MS Office 2010			
Why do you connect to, and explore the internet?					
Information	Research	Teaching methods	Learning material		
Leisure	Facebook	Business	Administration	I do not use it	
Do you use MS Word?					
Rarely	Sometimes	Often	All the time		
Do you use MS Excel?					
Rarely	Sometimes	Often	All the time		
Do you use MS PowerPoint?					
Rarely	Sometimes	Often	All the time		

Please answer the following questions as honestly as possible (remember your opinion will remain confidential.)

What is your primary drive for being a teacher?

_____

_____

Which aspects of your life as a teacher can be improved?

_____

_____

In which areas would you like to receive extra training in order to improve your teaching experience?

_____

_____

Why do you think it is necessary for a teacher to be computer-literate?

_____

_____

In which ways can the use of a computer, improve your teaching experience?

_____

_____

How do you feel about compulsory training for all in-service teachers?

_____

_____

How do you feel about the implementation of CAPS?

_____

_____

How is CAPS going to affect the quality of education of future learners?

_____

_____

How can on-going CAPS training be facilitated throughout South Africa?

_____

_____

How can developed schools help to facilitate underdeveloped schools in their area?

_____

_____

How can the community assist schools in its area in improving the level of education in South Africa?

_____

_____

Do you like working on your PC?

_____

Which functions does your PC fulfil in your everyday life?

_____

_____

In which ways do you use your PC to do your schoolwork?

_____

_____

If there is one multimedia facility that you would love to master – which would it be?

_____

_____

How would access to the internet improve your ability to teach?

_____

_____

If you could change one aspect of your work as a teacher, what would that be?

_____

_____

_____

Lastly, just a quick survey to determine the importance of technology in teaching: 1 = I do not agree at all to 5 = I totally agree

Access to information	1	2	3	4	5
More effective administration	1	2	3	4	5
Greater level of accountability	1	2	3	4	5
Facilitate underdeveloped schools	1	2	3	4	5
Improve the learning experience of student	1	2	3	4	5
Create effective teaching methods	1	2	3	4	5
Improve academic results	1	2	3	4	5
Transform information into knowledge	1	2	3	4	5
Networking with other teachers	1	2	3	4	5
Facilitate long distance training	1	2	3	4	5

THANK YOU FOR YOUR TIME AND ATTENTION!