THE ROLE OF SELF-REGULATION IN THE DEVELOPMENT OF COMPUTER LITERACY AT A VOCATIONAL COLLEGE IN THE WESTERN CAPE

A full Dissertation

by

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To be submitted in full fulfilment of the requirements for the degree:

MASTER OF EDUCATION

in

Learning and skills

at the

Wellington Campus

of the

Cape Peninsula University of Technology

Supervisor: Dr C Livingston

Date: June 2019

DECLARATION

I, Loren Caron Elias, hereby declare that this dissertation submitted is my own original work and has not been submitted previously to any other university. I further declare that all sources cited or quoted are indicated and acknowledged in an inclusive list of references.

Signature

June 2019

ACKNOWLEDGEMENTS

This thesis is dedicated to the memory of my beloved late grandmother,

Willma Elias,

Although she was my greatest motivation in finishing this thesis the past few years, she was unable to see my graduation. This is for her. Thank you for all the love, support, encouragement and prayer you had for me, it kept me motivated throughout.

I would like to thank God, to Whom all praise is due for giving me the strength, courage, ability and wisdom to complete this research: thank you Heavenly Father.

I hereby extend my sincerest gratitude and appreciation to the following people:

My supervisor, Dr. C Livingston for her advice, encouragement, patience, guidance and loyal support.

Connie Uys for the assistance with the statistical section of this research.

Hugan Anderson for the assistance with the transcription in the qualitative section of this research.

The students of Northlink College (Tygerberg Campus) without whom I could not have completed this thesis.

My pillars, Lewis, Delicia, Athalia, Luché and Jay-Ross thank you for the support, love, understanding and words of encouragement. Your generosity empowered and encouraged me to do my best and to achieve my goal. I am grateful that I never lost hope due to the continuous support from all of you.

Special thanks to my caring and loving family and friends for your motivation and prayers.

Annemie and Zaino for being caring and supportive during my studies.

ABSTRACT

The role of self-regulation in the development of computer literacy at a vocational college in the western cape

In TVET colleges, in the Business faculty students' need to be computer literate in order pass and graduate. All the students in the Business Faculty at a TVET college in the Western Cape of South Africa have a subject Computer Practice, which is a practical subject where they learn the basics about computers and develop computer literacy.

The key concern in this study is to determine how self-regulation can explain why some participants have high computer literacy and others have low computer literacy. Participants in this study are not familiar with personal computers and this in turn has a negative impact on student's learning at the TVET college.

The importance of self-regulated learning (SRL) is emphasised by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world. SRL can also refer to the degree to which students are proactive and responsible participants of their own learning process.

In order to o address the research questions, the researcher made use of a sequential explanatory mixed-method design. The quantitative phase was first conducted and allowed the researcher to investigate the phenomenon of self-regulation in the participants' computer literacy skills, in a vocational college and then a qualitative phase followed in order to explain the phenomena identified in the quantitative phase.

The results of this study indicate that self-regulation can help to explain why some participants have high computer literacy and others have low computer literacy. Both groupings were able to engage successfully in task analysis skills and have the ability to use and set goals, they make use of the skill of strategic planning, especially with regards to time management and planning, although low computer literates tend to rely on the lecturer more. Furthermore, both cohorts are able to use self-recording strategies by checking their notes, taking notes, keeping track of things and asking for help. They are also both able to engage in self-evaluation and check their goals. But

where self-regulation is able to explain the differing levels of computer literacy is in the self-reaction phase. Here there is a difference between what high computer literates do. High computer literates are able to try new things, work things out for themselves, try different strategies if they do not achieve their goals and are able to work on their own. Low computer literates on the other hand always tend to ask for help rather than react independently and state that trying harder might produce a different result. High computer literates therefor engage in adaptive self-reaction. There were other issues that came to the fore in this study that are not related to self-regulation and could help explain why the participants have such low levels of computer literacy. What the computer literacy test and interviews showed is that the participants do not understand exactly what computer literacy entails, that they are governed by fear of computers and that many of them do not have personal computers on which to practice. Furthermore, 80% of the population are being taught in a language that is not their home language. Language issues have come to the fore in this study, as the participants have indicated that they often do not understand what is expected of them.

In conclusion, it is extremely important to be computer literate because computers have become part of our everyday lives. For students to have a successful academic learning outcome, prime factors such as self-efficacy, commitment and self-regulation strategies are needed. Together with these prime factors, the input and support from the educator would also lead to promoting academic achievements and life-long learning.

LIST OF ACRONYMS AND ABBREVIATIONS

TVET	Technical and Vocational Education and Training
DHET	Department of Higher Education
SRL	Self-Regulated Learning
FET	Further Education and Training
DBE	Department of Basic Education
SEM	Structural Equation Modelling
CPUT	Cape Peninsula University of Technology
PLS	Partial Least Square
ILE	Interactive Learning Environment
ICT	Information and Communication Technology
ALA	American Library Association
US	United States
MS	Microsoft Office
IPA	Institution of Public Administration
DOE	Department of Education
OECD	Organization for Economic Cooperation and Development
NEEDU	National Education Evaluation and Development Unit
HEI	Higher Education Institutions
CAT	Computer Application Technology
GUI	Graphical User Interface
BECTA	British Educational Communications and Technology Agency

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CHAPTER ONE: ORIENTATION TO THE RESEARCH STUDY

1.1 Title

The role of self-regulation in the development of computer literacy at a vocational college in the Western Cape.

1.2 Keywords

Self-regulation, computer literacy, social cognitive theory, Department of Higher Education (DHET), self-regulated learning (SRL), learning strategies, interactive learning environment (ILE), blended learning, structural equation modelling (SEM), partial least square (PLS), motivation, goal settings, strategic planning, self-recording, self-evaluation, self-reaction, self-efficiency, triadic reciprocal relationships, Department of Basic Education (DBE), Further Education and Training (FET), Technical and vocational education and training (TVET), application programs, life-long learning, computer skills and knowledge.

The rapidly changing nature of technology development and the contexts in which education operates, force students to become competent at using computers. It also requires the development of such personal characteristics as self-reliance and commitment to ongoing learning about computer literacy, creativity and adaptability in approaching new technologies and their users, the ability to conceptualise computer literacy values and processes, motivation to sustain learning and the ability to monitor one's own thinking and learning approaches. Self-regulated learning determined by the nature of self-regulation as viewed by Zimmerman (2000). The way Zimmerman views self-regulated learning from a social cognitive perception, social cognitive theory is discussed, where after self-regulated learning is defined from a social cognitive perception, followed by a discussion of Zimmerman's (2000) model of self-regulation. The importance of self-regulated learning is highlighted by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world (Zimmerman, 2002: 64).

The social cognitive theory addresses how instructions can apply the views to assist in the acquisition of computer literacy skills. In order to understand the instructions of computer literacy skills, a 21st century application of the social cognitive learning theory sets the instruction through the use of technology (Lui, 2010). In this study, social cognitive theory of human functioning, emphasises the ability for one to be in control of one's own outcomes, self-efficacy and the belief that one can achieve those outcomes. Cognitive development is

necessary for students to self-determine their outcomes. The mind does not simply react to the events of one's surroundings, but the mind also develops cognitive abilities that enable individuals to adapt, adjust and to function in a dynamic world (Bandura, 2000). Bandura (1999:23) states that cognitive processes are not only emergent brain activities, they also exert determinative influence.

There are three bands of South African education system:

- General Education and Training (GET) runs from grade 0 to grade 9. GET is according to the Bill of Rights of South Africa's Constitution, a right and should be made available and accessible by the state.
- Further Education and Training (FET) usually takes place from grade 10 to grade 12, however, career-orientated and technical education and training offered at FET (TVET) colleges is also included in this band.
- The third and final band is Higher Education and Training (HET) or tertiary education. This band includes both undergraduate and postgraduate degrees, diplomas and certificates. The highest level of tertiary education is a doctoral or terminal degree.

1.3 Introduction and statement of the problem

Since the introduction of the post-apartheid government in 1994, the technical and vocational education and training (TVET) framework in South Africa has been introduced. This was done in order to cater to the vocational needs of the student population who do not and cannot attend other tertiary institutions. TVET colleges are described as offering National Certificate Vocational (NCV) programmes (N1-N6) and learnerships through a range of SETAs according to the Human Resource Development Council (2014) and offer a pathway to studying at Universities of Technology. TVET colleges also offer many school leavers the opportunity to study at college and offer general vocational qualifications in preparation for either higher education or entry-level employment (Gewer, 2010). TVET is described by Anderson (2009) as 'productivism', and this worldview is based on two interrelated suppositions. In the first place, that "preparation prompts efficiency, which prompts financial development (preparing for-development)" and second, that "abilities lead to employability which lead to occupations (aptitudes for-work)" and along these lines diminishes destitution and joblessness (McGrath, 2012a: 624). These aspects of TVET training lead to human prosperity (Lopez-Fogues, 2011; McGrath, 2012; Powell, 2012), neediness easing, value (Stevenson, 1993) and employability and economic growth (Allais, 2012). This idea is highlighted in a quote by Bonn (2004) when it is stated that:

"*Since education is considered the key to effective development strategies, technical and vocational education and training (TVET) must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help achieve sustainable development"*.

The most important aspect of TVET is its directed vision towards the world of work and the accentuation of the educational plan in the gaining of employable abilities. TVET college frameworks are consequently geared to prepare the workforce that South Africa needs to enrich society and lead to the alleviation of poverty. TVET colleges can reactively prepare to meet the diverse needs of students from various financial and academic backgrounds in order to set them up for productive business and manageable occupations. The adolescents, poor people and the defenseless in society can in this way benefit from the TVET framework.

Part of the Western Cape Government's strategy is to improve the quality of learning across the education and training system. The focus of the TVET policy is on learning and teaching for a new generation of young people who are growing up in a digital world and who are comfortable with personal computers (Department of Higher Education and Training (DHET), 2013). Further Education and Training (FET) colleges have responded to the need that was identified by DHET by implementing personal computer skills in their course offerings and including computer related subjects.

In the TVET college in this specific study, the Business faculty students' need to be computer literate in order pass their course and graduate. All of the students in the Business faculty have a subject called Computer Practice, which is a practical subject where they learn the basics about computer usage.

The researcher has experienced that students who are not computer literate have a negative attitude towards personal computers. In the researcher's personal experience, this would be because students are not familiar with personal computers and this in turn has a negative impact on student's learning at the TVET college. According to Liu, Lee and Chen (2013) attitudes are learned and are closely related to one's experiences in the process of learning, they define attitude as the external manifestation of an individual's evaluation of an entity, based on previous knowledge and beliefs. It is important to be computer literate in today's world of advanced technology and TVET colleges aim to ensure this fact

Linked to the idea that students need to be computer literate, is the idea that self-regulation is also importance. The importance of self-regulated learning (SRL) is emphasised by the

importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world. SRL can also refer to the degree to which students are proactive and responsible participants of their own learning process. (Zimmerman, 2008). Because of the changes in worldwide technology, students are expected to adjust the skills that they already possess and learn new skills in order to cope (Zimmerman, 2002: 64). The researcher believed that the role self-regulation would improve student's computer literacy skills. Previous research on academic SRL is seen to help clarify achievement differences among students and as a means to improve achievement. SRL refers to the ability of a student to understand and control his/her learning process and outcome (Schraw, Crippen & Harley, 2006). The researcher experienced that SRL is not always applied with student learning and sees it as the gap in student's computer literacy.

According to Bartimore-Aufflick, Brew and Ainley (2010:453) some practical and curriculum design ideas for improving student SRL includes:

- Explicit instruction and discussion of both learning strategies and regulation skills as part of the curriculum.
- Providing opportunities for students to reflect on their strengths and weaknesses and learn from recent experiences.

The various links between self-regulation and computer literacy have been investigated in various contexts. Paraskeva (2007) conducted research which aimed to determine the link between computer self-efficacy and self-regulated learning strategies while Neville and Bennett (2004) explored how self-regulation could lower the discomfort experienced by students while becoming fluent in information technology. The link between self-regulation and computer literacy at TVET colleges has not been made however. Hence the need for this study.

Computer literacy is defined as the ability to use personal computers at an adequate level for creation, communication and collaboration in a literate society (Son, Robb & Charismaidji, 2011:27) and is seen as one of the most important skills a person can have in today's competitive environment. William (2002) states that a person must have a clear understanding of computer characteristics, the different application programs (Microsoft Word, Excel, Access and PowerPoint) and skills to implement knowledge in an accurate and dynamic way. The 21st century has given rise to a digital generation, to be better prepared for the professional world.

Computer literate students with a broad knowledge and skills of personal computers can successfully complete various tasks. The researcher has derived that it would be beneficial to

students to have thorough computer literacy and possess self-regulation knowledge and skills, and that it would not only assist and improve their computer related subjects but also all their other subjects and personal lives.

1.4 Theoretical and conceptual framework

Personal computers have become part of our everyday lives thus the need for proper training has become extremely essential. The way computer literacy skills are used in a vocational college would depend on the learning objectives and the environment of the students. According to the Department of Basic Education (2011) it is important to set out the basic principles which should guide the use of personal computers in learning. This study focused on investigating what self-regulatory skills have an influence on the effectiveness of computer literacy on students in a vocational college. Self-regulated students can be recognised by their understanding of strategic relations between regulatory processes and the use of measured practice of self-regulative processes to achieve successful learning and new skills (Panadero & Alonso-Tapia, 2014:450).

This study was rooted in the work of Bandura (1986) and social cognitive theory. Social cognitive theory states that "social" refers to the human interaction interlaced with emotions, thoughts, actions and its role in motivation, while "cognitive" refers to the processes of self-observation, evaluation and its role in motivation. Albert Bandura, who developed social cognitive theory, views a person as self-organised, proactive, reflective and self-regulated. The basis of Bandura's (1986) social cognitive theory is that human functioning is the product of a dynamic, reciprocal and triadic interaction between personal (e.g. student's knowledge, metacognition, motivation and anxiety), behavioural (e.g. self-observation and self-reaction) and environmental variables (e.g. academic outcomes, modelling and feedback from educators).

Bandura's Social Cognitive Theory (1986) was built on the social learning theory, views of response consequences, distanced learning and modelling of behaviour (McCormack, 1999). Social cognitive theory used in student learning, holds that portions of a student's knowledge acquisition would be directly related to observing others within the perspective of social interactions, experiences and other influences. People observe others by performing a behaviour and the consequences of that behaviour, they remember the sequence of the events and use the information to guide the subsequent behaviours (Bandura, 2002).

Zimmerman (2008) developed Bandura's concept of social cognitive theory and self-regulation further by distinguishing three cyclical phases of self-regulated learning: forethought (goal setting, strategic planning, self-efficacy thoughts, goal orientation and intrinsic interest),

performance (attention focussing, self-instruction and self-monitoring) and self-reflection (self-evaluation, attributions, self-reactions and adaptivity) (Puustinen & Pulkkinen, 2001:277; Zimmerman, 1990; Zimmerman, 1998:4; Zimmerman, 2002). The researcher used the model proposed by Zimmerman (2002:65), to explain the purpose of this study.

Zimmerman (1998:6) goes on to say that skilful students adapt these self-regulatory phases to achieve learning.

Models of self-regulation which are grounded in social cognitive theory, define self-regulated learning as a goal-orientated process that emphasises the constructive and self-regulated character of self-regulation (Muis, 2007:175). Models within this social cognitive framework for example Zimmerman's Social Cognitive Model of Self-regulation (Zimmerman, 2000) suggest that monitoring, regulating and controlling one's learning include cognitive, motivational and social factors. Self-regulation of learning would be a major component for all academic achievements. Self-regulated students engage in actions, thoughts and behaviours in to pursue determined tasks by identifying goals, strategies, monitoring and evaluating them (Weimer, 2010).

From a social cognitive viewpoint, Schunk (1989:83) and Pintrich (2000:453) assign a prominent role to goal-setting in their definitions of self-regulated learning. Schunk (1989:83) defines self-regulated learning as *'learning that occurs from students' self-generated behaviours systematically orientated toward the attainment of learning goals'*, while Pintrich (2000:453) states that *'self-regulated learning is an active, constructive process, whereby learners set goals for their learning, and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of their environment'.*

According to the researcher, because of the introduction of social cognitive theory clarifying how students obtain skills, competencies, personalities, beliefs and self-regulation, educators and other researchers can apply the theory to different aspects of development and learning. During the last few decades, self-regulation of learning has acquired a fundamental role in all areas of learning including sport, academic learning and technological disciplines. There is a global interest in self-regulation theory with the most notable research and intervention in self-regulation being conducted in Africa, South and North America, Europe, Australia and Asian countries (Azevedo, Greene & Moos, 2007; Vohns & Baumeister, 2011).

Woolley (2011) stated that positive training in self-regulation is essential in developing independent learning. Students are expected to self-regulate their learning while maintaining high motivation in their academic education. However, not all students possess the ability required to self-regulate their learning independently. Students need guidance and support in

developing the skills to self-regulate their learning. Computer literacy is developed with the use of computers and in a blended learning environment. Marsh (2012:3) defines blended learning as any combination of different methods of learning, different learning environment and different learning styles. Blended learning could also be described as an integrated approach to learning with personal computers (Hew & Cheung 2014:2-3). These literacy levels vary between individuals and designations of digital technology (Pool & Du Toit, 2014: 106-107). According to the researcher, blended learning and computer literacy could be linked with SRL to fill the gaps and challenges that student's experience during the use of personal computers or completing academic tasks.

1.5 The research questions

Based on the review of literature the following research questions were posed:

Main question:

- How does the theory of self-regulation help to explain why some participants have higher computer literacy skills than others?

Sub-questions:

- How do the participants understand the concept of computer literacy and the importance thereof?
- What differences currently exist with regards to self-regulated strategies between participants with high computer literacy and those with low computer literacy?

1.6 The purpose of the research

The aim of this study was to gain a deeper understanding of the role of self-regulated strategies and the development of participants' computer literacy skills when personal computers are integrated into course delivery at a vocational college in Cape Town. The purpose of this study was to determine the self-regulated learning strategies needed to be computer literate. Also to determine the different feeling participants experience when working on personal computers and through that determine their confident level with the computer.

1.7 Research design

In order to understand and address the research questions the researcher made use of a sequential explanatory mixed-method design. The rationale behind selecting a sequential mixed-method design lies in the purpose of the research. The quantitative design was firstly

conducted and allowed the researcher to investigate the phenomenon of self-regulation on student's computer literacy in a vocational college and then a qualitative design followed in order to explain the phenomena exposed in the first phase of the study. In order to support the above, Ponce (2014) states, a researcher should begin his study with a research approach (phase 1: questionnaire) and uses the findings to design a second phase (interviews).

1.7.1 Quantitative research

The quantitative stage of this sequential explanatory mixed-method design used two instruments to collect the data needed to answer the research question. These instruments were a 'Self-regulation in computer literacy' questionnaire and a computer literacy test.

- **Participants**

The participants in the quantitative stage of this study were selected from the Business Faculty at a particular campus of a vocational college (TVET) in the Western Cape. The researcher used non-probability sampling (convenience and purposive sampling). The campus was selected by using convenience sampling and the site was chosen because it is readily available to the researcher. The participants consisted of 120 N4 level students. Purposive sampling was used, the researcher selected 30 students per department (Business Management, Marketing Management, Financial Management and Human Resources Management) to participate in the questionnaire and test. This was done in order to get a cross-section of all N4 level students for this study.

- **Instruments**

Two instruments were used to collect the data in the quantitative stage, which was designed in order to reach the research objectives. The researcher designed a 'Self-regulation in computer literacy' questionnaire which also collected the biographical information of participants (see Appendix 1). The second instrument used was a computer literacy test (see Appendix 3).

The instruments used in this study in the quantitative stage aimed to identify the self-regulated learning strategies needed to be computer literate and the computer literacy test scores were used to determine participants with high computer literacy and low computer literacy, in order to sample the population for the qualitative stage of this study.

- **Validity and reliability**

The questionnaire was piloted to ensure validity and reliability of the instrument. According Muller (2015) the questionnaire will be reliable if the same result is obtained repeatedly when

the questionnaire is re-administered or tested repeated. In answering the questions, this instrument clearly considered the influences that contributed to the students' learning through personal computers. The validity of a measuring instrument indicates whether that instrument measures what it is supposed to measure (McMillan & Schumacher, 2010:486). Validity is the most important characteristic a measuring instrument can possess and by piloting the questionnaire, the researcher aimed to ensure that the questionnaire was testing what it aimed to test.

Content validity of the questionnaire refers to the extent to which the questionnaire covers the complete content of the concepts that it is set to be measured. The questionnaire was developed to measure self-regulation and computer literacy skills, the questions in the questionnaire covered the different aspects. Face validity is ensured when an expert researcher in the subject field, reviewed the instrument and declared that the measuring instrument covered the concepts that it should cover. The instruments used were grounded in the research questions and the theoretical framework of this study. Construct validity of the questionnaire refers to the extent to which the questionnaire was measure the characteristics that were observed but must instead be referred from patterns in a person's behaviour (e.g. motivation, creativity – are all constructs), evidence was therefore obtained to measure the construct being discussed (Maree & Pietersen, 2007:146).

Blumberg (2011:500) portray reliability as a characteristic of measurement concerned with exactness, precision and consistency. Reliability also refers to the consistency of the measuring instrument used; in this study the researcher was consistent when she designed the questionnaire.

1.7.2 Qualitative research

With-in a sequential explanatory mixed-method design, the qualitative data was used to explain and augment a phenomenon exposed by the quantitative data. A deeper probing of the types of self-regulatory strategies used, to determine how computer literacy is viewed by participants and the challenges encountered by participants to become computer literate were probed. The data in the qualitative stage of this study was collected by using semi-structured face-to-face interviews.

- **Participants**

By using interlaced sampling (Flick, 2007:112), 10 % of the quantitative population, those with high computer literacy (5%) and those with low computer literacy (5%), were identified from the computer literacy test scores, to be interviewed.

The researcher used convenience sampling because it was easy for the researcher to make contact with the participants. It is the least costly for the researcher, in terms of time, effort and money (Sauders, Lewis & Thornhill, 2012).

A purposive sample is a non-probability sample that was selected based on characteristics of a population and the objective of this study. Purposive sampling is also known as judgmental, selective, or subjective sampling (Crossman, 2017). The researcher intentionally interviewed the participants on their views and opinions about the influences of self-regulation and their perceptions of computer literacy. The reason for convenience and purposive sampling is that participants were convenient because they were known by the researcher and seen daily at the particular campus and the sampling was purposive because those participants with high computer literacy scores and those with low computer literacy scores were interviewed in order to answer the research questions posed. Most sampling methods are purposive in nature because researchers usually approach the sampling problem with a specific plan in mind and as such, so was the sampling in the qualitative phase of this study.

- **Instruments**

The purpose of conducting interviews as part of the qualitative stage of this sequential explanatory mixed-method study was to gather in-depth data regarding the participants' experiences related to self-regulatory strategies that these participants work in order to become computer literate. A semi-structured face-to-face interview schedule was implemented based on the findings of the quantitative stage to guide the researcher during the interview processes.

The semi-structured interviews were held in the classroom after class at the campus in the afternoon. The interviews were 25-35 minutes each and 12 were conducted in total. Thus, it was important for the students to feel safe and in an environment that they feel comfortable. The interview sessions were based on open-ended questions (statements) where the participants were allowed diversity in responses as well as the capacity to adapt to new developments and issues. This allowed them to be free to state their views and opinions as there are no wrong and right answers. The researcher clearly explained the procedure and facilitated the discussion to prevent concerns being raised not related to the topic

- **Trustworthiness**

A central issue in qualitative research is trustworthiness (also known as credibility or dependability). There are many ways of establishing trustworthiness, including member check, interviewer corroboration, conformability and balance among others. For the qualitative data the researcher ensured the trustworthiness within the answers of semi-structured interviews.

The researcher also ensured the credibility to assure accuracy of the data that the researcher interpreted during and after the interview. Lincoln (2009) expresses about the importance of maintaining trustworthiness within the qualitative research by stating that it has been an exception rather than the rule that a qualitative research report includes a discussion of reliability and validity.

A researcher must determinedly record the criteria on which category decisions are to be taken (Dey, 1993:100). The ability of a researcher is to use the interview data analysis framework in a flexible manner in order to remain open to alterations, to avoid overlaps and to consider previously unavailable or unobservable categories, is largely dependent on the researcher's familiarity and understanding of the data.

1.7.3 Quantitative data analysis

Statistical analysis and descriptive statistics were used in the quantitative analysis phase of this study. Descriptive statistical procedures were used to organise, analyse and interpret the data according to the sections in the 'Self-regulation in computer literacy' questionnaire and the computer literacy test. Dimensions were noted as answers to the Likert scale and converted into percentages to acquire scores for the purpose of the quantitative clarification by using the frequency distribution table. The means and standard deviations of the objects were calculated.

1.7.4 Qualitative data analysis

Thematic analysis was used by the researcher for the analysis of the qualitative data (semi-structured interviews). The researcher transcribed all the interviews in order to transform the data from the recorded interviews to derive information from the participants to grasp a greater perceptive of the self-regulatory concepts and computer literacy skills in the interview schedule of this study. Maree (2016:115) states, that by reading and re-reading the transcripts, this gives the researcher a thorough understanding of the data gathered and by doing that it is a good analysis. The data gathered in this stage were analysed through the process of coding and categorization.

1.8 Ethical considerations

Nkwi, Nyamongo and Ryan (2001) advise that whenever we conduct research on people, the well-being of research participants must be our top priority. The research question is of secondary importance. This means that if a choice must be made between doing harm to a participant and doing harm to the research, it is the research that is sacrificed.

The researcher abided by the principle of respect for participants whereby she made a commitment to the participants to ensure autonomy. The dignity of all participants was respected. Adherence to this principle, the researcher ensured that participants were not used to achieve the research objectives. Information was protected as a manner of principle.

An Ethics number (EFEC1-5/2017) was issued by the Faculty of Education of the Cape Peninsula University of Technology (CPUT) and was granted to the researcher. This Ethics number was granted in accordance with the criteria set out by the Faculty of Education Ethics Committee.

1.9 Administrative procedures

Approval was granted by the ethics committee of Cape Peninsula University of Technology (CPUT), Department of Higher Education (DHET) as well as by the campus manager, academic manager, head of department and programme manager of the TVET college. The campus manager was informed by a letter of informed consent via email to inform them about the research study. The researcher also gave the participants a letter of informed consent, which they had to sign, and she informed the participants that their participation was voluntary and not coerced.

1.10 Chapter division

The following chapters represented the structure of this research:

Chapter 1: Introduction and overview of study

Chapter 2: Computer literacy and self-regulation

Chapter 3: Research design and methodology

Chapter 4: Analysis and Interpretation of the data

Chapter 5: Summary, findings and recommendations

CHAPTER TWO: COMPUTER LITERACY AND SELF-REGULATION

2.1 Introduction

Computers have become an essential part of our everyday functioning and as such, proper training in the skills necessary for computer literacy has become vital. Before one can begin a discussion of the sub-genre of computer literacy, it is important to define how it fits into the overarching themes of digital and information literacies. Computer literacy can be regarded as one of the most important skills a person can have in today's competitive environment. It can be defined that one must have a clear understanding of computer characteristics, the different application programs (Microsoft Word, Excel, Access and PowerPoint) and skills to implement knowledge in an accurate and dynamic way (William 2002). It would also mean to have some sort of comfort around computers rather than having some fear or a feeling of foreboding. Computer literacy is seen as a sub-genre of digital literacy which will now be defined.

These characteristics are also inherent in self-regulated learning (Zimmerman, 2001). Self-regulated learning refers to the ability of students to understand and control their learning processes and outcomes (Schraw, Crippen and Harley, 2006). Research has shown that self-regulated learning is an important aspect of student academic performance. Students practicing self-regulation behaviours initiate and direct their own efforts to acquire knowledge and skill rather than relying on educators, parents or others. In general, self-regulated learning consists of three essential elements: commitment to academic goals, self-efficacy perceptions and self-regulated learning strategies (Zimmerman, 1989).

Self-regulated learning in this chapter was determined by the nature of self-regulation as viewed by Zimmerman (2000). The way Zimmerman views self-regulated learning from a social cognitive perception, social cognitive theory is discussed, where after self-regulated learning is defined from a social cognitive perception, followed by a discussion of Zimmerman's (2000) model of self-regulation. The importance of self-regulated learning is highlighted by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world (Zimmerman, 2002: 64).

Students will require computer literacy abilities when information becomes obsolete or changes in their educational learning with a specific end goal to comprehend and make utilization of learning in their field of study. Pinto (2010) states that computer literacy grasps both the utilization and the formation of data under the umbrella of basic reasoning and feelings. Students must have the capacity to react rapidly by applying their insight and aptitudes in a basic reasoning circumstance identified with computers.

All aspects of life from education, workplace, social cooperation's and even get-aways are affected by computers. With the expanding utilization of computers in education, new aptitudes and capabilities among students are required for them to officially learn. While at the same time a few researchers characterize and measure computer literacy as far as the quantity of computer courses finished, the measure of time spent on the computer, having a computer at home, others consider the learning with computer terms, encounters and capacity.

In today's information reliant society, it requires one to be a flexible and independent individual that is able to manage the transmission of a huge volume of information. Researchers have noted that the goal of higher education is to faster students to become capable, independent, self-regulated and efficient students (Pintrich and De Groot, 2000). One of the main aims is for students to become responsible, effective, independent and confident for their own learning. An efficient learning process is a critical factor in higher education in the sense that it may provide innovative technological approaches, such as learning tools in order to define strategies that would enable students to manage their own learning (Povatong, 1999).

2.2 Digital literacy

Digital literacy has picked up significance around the globe. As Martin (2006:3) stated, digital literacy is a blending, that "focuses upon the digital without limiting itself to computer skills and which comes with little historical baggage". Digital literacy incorporates the ability to take up the things exhibited on the computer, yet in addition to have the capacity to appreciate computer-based stimulation and interchanges, similar to conceptualization of media proficiency (Potter, 2011). The U.S. Department of Education characterized digital literacy as having "computer skills and the ability to use computers and other technology to improve learning, productivity and performance". Barrette (2001), Corbel and Gruba (2004) contend that digital literacy comprises of two fundamental components: (1) the capacity to control essential computer procedures and utilizing your own comprehension of computers for critical thinking and basic reasoning in a circumstance or undertaking.

Gilster (1997:15), noticed that digital literacy is an extraordinary sort of outlook, about acing thoughts not keystrokes. Considering the above definitions of digital literacy, it can be stated that digital literacy is based on three standards:

- skills and information to access and utilize a decent variety of equipment gadgets and programming applications
- ability to comprehend and basically investigate digital substance and applications
- ability to build advanced innovation (Media Awareness Network, 2010)

Digital literacies link with practices proceeded by abilities, methods and mentalities that empower the outline and comprehension of thoughts utilizing a scope of modalities empowered by digital devices (O”Brien & Scharber, 2008: 66-67). Digital literacy instruments incorporate ICTs, computer games, remote interfaces and other hand-held gadgets (Skudowitz, 2009). Digital literacies additionally include cooperation, commitment and significance (Kalantzis, 2011), notwithstanding data operation, origination, assessment and generation (Lankshear & Knobel, 2006). Belshaw (2012) plots eight key components that interpret digital literacies:

1. Cultural: This is the need to comprehend diverse online settings and how to connect legitimately in them.
2. Cognitive: This is about methods for abstracting 'digitality' as opposed to the act of utilizing devices.
3. Constructive: This contains the capacity to create remixes.
4. Communicative: This is tied in with seeing how correspondences media function.
5. Confident: The need to be innovative and have enough specialized skill to have the capacity to utilize innovation for our own closures, instead of be controlled by it.
6. Creative: This is the capacity to discover better approaches to do new things with new instruments.
7. Critical: This is the need to figure out how to 'curate' and fundamentally comprehend the assets that we find and not simply externally skim over data.
8. Civic: This is tied in with knowing how to utilize innovation to build open arrangement and social activity.

Van Deursen and Van Dijk (2009) anticipated a digital skills model that comprises of four classifications: operational skills or skills important to work with computer equipment and programming; formal abilities or the capacity to comprehend and handle formal qualities of computer systems and websites; data aptitudes or the capacity to choose, assess and process data and key abilities or the capacity to utilize ICT to achieve an objective.

Martin and Grudziecki (2006) broaden this model into three phases of digital literacy improvement: skill, utilize and change. Digital capability portrays the establishment where essential abilities are created and approaches conveyed. Digital competence comprises of learning, capacities and attitudes (Martin & Grudziecki, 2006). Digital competence is utilized to clarify, distinguish and take care of computerized issues. Martin and Grudziecki (2006) see

this as the most imperative level of digital literacy, it is the thing that characterizes one as carefully proficient, and however it likewise creates the drive for computerized change. Digital change is the transformative change happening, where innovativeness and unrest are allowed.

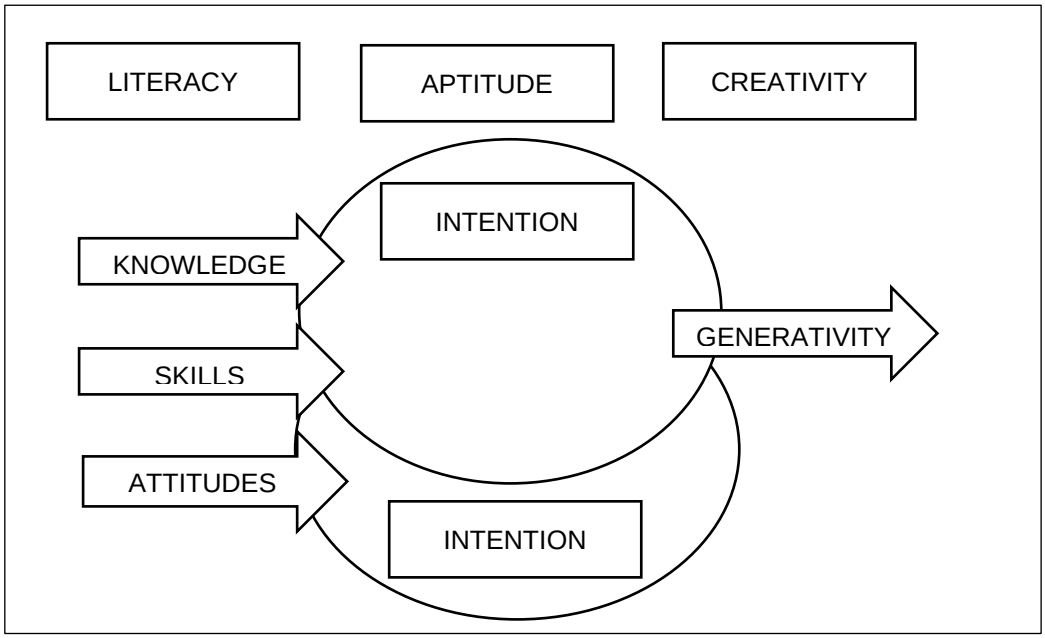

Figure 2. 1 *A Model of Digital Literacy:*

Adapted from "Generativity: The New Frontier for Information and Communication Technology Literacy" by J. Pérez and M. Murray, 2010, Interdisciplinary Journal of Information, Knowledge and Management, 5:132. Copyright 2010 by Informing Science Institute.

The expansive model proposed by Pérez and Murray (2010) coordinates goal and reflection as nuts and bolts in the digital literacy perception (Figure 2.1). In this model, information, aptitudes and attitudes converge with regards to intelligent mindfulness and resolved to enable a computer user to finish generativity, the capacity to develop new abilities and learning that shape the reason for inventiveness (Pérez & Murray, 2010). The capacities of literacy, inclination and innovativeness are encased on the model to outline development from foundational to mindful to imaginative relations with computer technologies. Literacy includes learning, abilities and states of mind, fitness catches reflection and aim; generativity implies the potential for innovativeness. The overlay of literacy, skills and creativeness is intended to give meaning to the complex, iterative processes by which users learn about interact with adapt and transfer information technology objects and concepts.

The view of digital literacy as indicated by O"Brien and Scharber (2008: 66) has an extensive variety of descriptors, for example, advanced media, new technologies, new skill levels or new proficiency. O"Brien and Scharber (2008:66) characterizes digital literacy as socially arranged practices strengthened by abilities, procedures and attitudes that permit the representation of thoughts utilizing a scope of modalities empowered by digital apparatuses.

2.3 ICT Literacy

- **The role of Information and communication technologies in computer literacy**

The world has embraced quick changes in the fields of information and communication technology (ICT) and the part of the 21st century students need to adjust hence to fit and exist inside the said changes in the classroom. Osuji (2010) states that for all goals and purposes every one of the regions of human life today require education regarding the computer. It is in this manner required for the cutting-edge educators to be exceptionally computer educated to have the capacity to help modern students to fit into the advanced society. The utilization of computers is imperative for students, as computers are basic for network change, students' future openings for work and neighbourhood and national development. Having ICTs in student training is a vital change that is need in order to the answer requests of the general public, there is expanded work environment interest for computer literacy representatives in the advanced world and this request might be expert through ICTs in education.

Students should pick up the certainty and aptitudes to embrace and to utilize ICT in appropriate ways. “The concept of ICT literacy should be broadened to include critical cognitive skills such as reading, numeracy, critical thinking and problem solving and the integration of those skills with technical skills and knowledge” (Williamson, Katz, & Kirsch, 2011:5). ICT is frequently seen as a substance for change, change in learning strategies and to get to certain data (Watson, 2005). ICT refers to technologies that offer access to data through broadcast communications. The utilization of ICT has changed the ordinary methods for learning and proposes the need to re-evaluate instruction as far as a more present context (White, 2010).

ICT enables access to thoughts and experiences from an extensive variety of individuals, networks and societies, and enables students to collaborate and trade information on a wide scale (Crown, 2010). Education is the first and best key territory for ICT applications. The reason for ICT in education is to disclose to students the utilization and works of computers and related social and moral issues. The quick take-up of computer utilization better equips students to figure out how they learn and how they clarify their educational decisions. On the off chance that students can't effectively work on computers, the research contends that the

students would not have the important foundation on which to engender the aptitudes that are expected to completely take an interest in the present computerized society.

It is fundamental for students to be computer literate in this ICT based time. Computer literacy will help understudy certainty, once students have the confirmation of computer literacy skills, their trust in utilizing computers is supported. Starkey (2010) states that enhancing ICT use, learning builds computer advancements and helps shape confidence. Kpolovie (2010) concurs with the above and includes that through computer literacy students end up mindful of their own proficient improvement needs. When students appreciate the use of computers in colleges, the work becomes easier for them (Lawal, 2012). Kvasnica and Hrmo (2010) differs from Lawal (2012) and states that it is:

The human competency to use one's own knowledge, skills and abilities from the close sphere of the hardware and software computer equipment, as well as from the wider sphere of ICT, for the collection, storage, processing, verification, evaluation, selection, distribution and presentation of information in a required form and quality to achieve their relevancy to a specified destination.

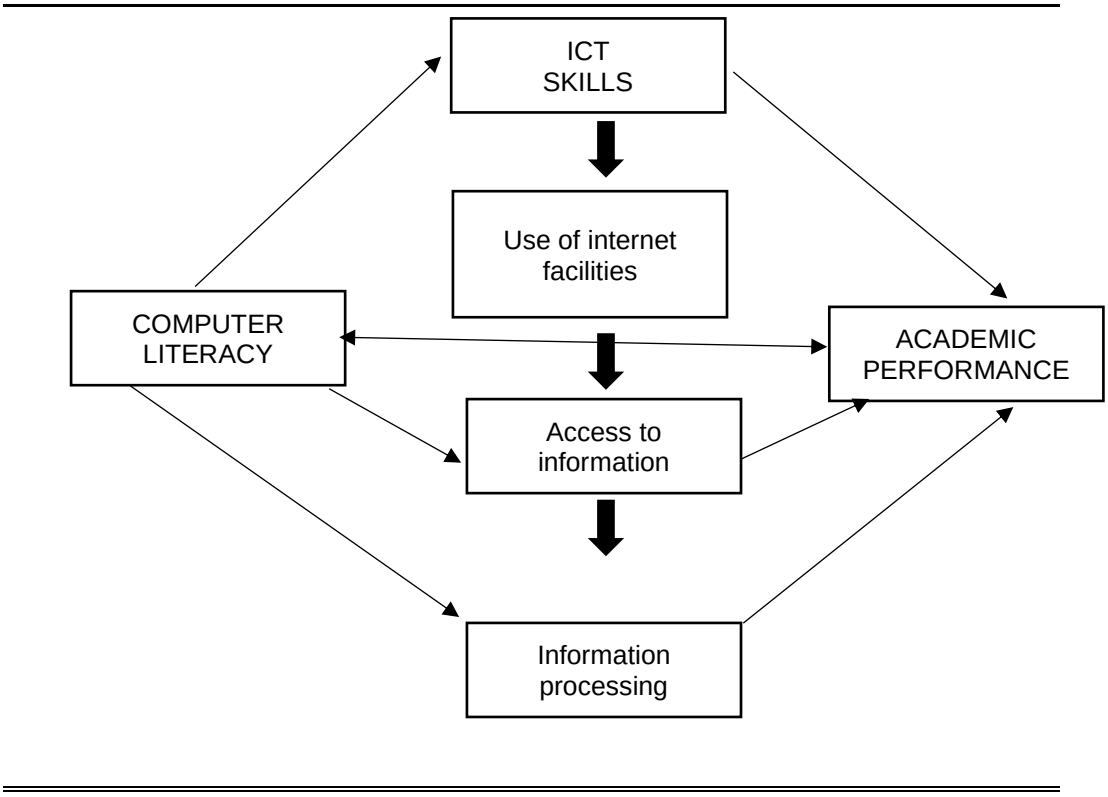

Figure 2. 2 The process of computer literacy (Designed from the Digital Literacy Skills by (Pérez & Murray, 2010)

The above processing computer diagram indicates that computer literacy is the bed rock of thorough academic performance and is essential in productive information processing. The diagram also indicates that when one is computer literate, ICT skills are developed and when

the skills are developed, the use of internet facilities becomes very easy due to constant practices.

Mbaeze, Ukwandu and Anugu (2010) state that ICT has an impact on students' educational accomplishments and that students must be open to innovation to have computer knowledge. ICT can enhance the nature of education, make learning openings and make education accessible.

Educational establishments utilize ICT as a premise of instructional conveyance frameworks intended to expand aptitudes and information in other learning territories. However, they utilize ICT as an apparatus for getting to the resources, announcement, and analysing. Be that as it may, educational frameworks likewise need students to create ICT abilities and information and to comprehend the part of ICT in learning, work, and society.

2.4 Computer literacy

- **Definition**

Computer literacy is an ambivalent term which has led to debates among researchers who have concluded that there is no agreement among researchers on a definitive definition and measurement of computer literacy. Originally, computer literacy was a term that was coined by Luehrmann (1981), who believed that computer literacy was the equivalent of being proficient in programming skills and the use of computer software such as word processing. Simple definitions state that computer literacy involves having a basic understanding of what computers are and how they can be used as a resource (Anunobi 2004). Adeyinka and Mutala (2008) and Idowu (2004) agree with the statement above by adding that computer literacy can be seen as knowing some of the basics necessary for using the computer, for example: to save and open a file, use a word processing program, send and receive e-mail etc. San Antonio College adds another dimension to the definition by stating that knowledge of computer terminology is also an important component of computer literacy.

The term was later expanded to cover a variety of computer skills and sureness of use. Adagunodo and Idowu (2004), Poynton (2005) and Hoffman-Goetz (2009) concur and indicate that knowledge, skills and confidence with the use of computers are now an asset for entering the competitive employment market. Eshet-Alkalai (2004) and Goede and Steyn (2011) state that the specific skills needed to enhance computer literacy includes a variety of complex abilities, which include booting up a computer, how to use a keyboard, edit work and retrieve information from the computers, which users need in order to function effectively in digital environments, while William (2002) notes that these skills need to be implemented in an

accurate and dynamic way. The term also includes the notion of having some sort of comfort around computers rather than having some fear or a feeling of foreboding.

The development of computer literacy is also hierarchical. Ikolo and Okiy (2011) have noted that computer literacy is defined as the knowledge and ability to use computers and related technology efficiently with a range of skills covering levels from elementary use to programming and advanced problem solving (Ikolo & Okiy, 2011).

Mitra (2008) and Loyd & Gessard (2004) go one step further by adding that computer literacy can only be engendered with actual practical computer usage. Other aspects such as the amount of computer knowledge, ownership of computers and the number of computer related courses taken, also influence the development of this literacy. Kay (2006) concur with the above by saying that computer literacy is concerned with computer experience and the use of programming skills together with the ability to use software.

Mason and McMorrow (2006:94) suggested there are two distinct components to computer literacy: awareness and competence. Awareness requires an individual to have knowledge of how computers affect his/her daily life or society as a whole and competence on the other hand requires an individual to demonstrate a hands-on proficiency with a software application. These skills are essential in today's educational structures as more tasks are completed using computer technologies.

- **The need for computer literacy**

The requirement for computer literacy has turned out to be generally acknowledged as a technological need of current life (Stephens & Shotic, 2007). In connection to the need of computer literacy Adeyinka and Mutula (2008) feature the significance of it in higher education, they trust it is to a great degree vital for utilizing e-resources and word handling. In the inexorably computerised library conditions, students can't discover books by looking in a card index however they should utilize electronic databases (Hall, 2005). Computer literacy could accordingly be a colossal resource that would help them in recovering applicable data required in libraries, it would be in light of a legitimate concern for students to be computer literate on the grounds that it would empower them to recover and utilize resources.

Computer literacy could be viewed as the key capacity that is of significance for independent studying, self-coordinated learning, deep rooted learning and social improvement. As indicated by Pinto (2010) computer literacy is fundamental for the cutting edge seriously data-based world and it likewise creates individual, financial, social and cultural improvement. The American Library Association ((ALA), 2000) includes that computer literacy frames some portion of the premise of deep-rooted learning and it can empower students to aquire

substance, turn out to be more self-coordinated and take full control over their learning procedure certainly. As per the ALA (2000) a computer literate student must have the capacity to:

- Determine the degree of data required
- Access required data successfully and productively
- Access data and its sources fundamentally
- Incorporate chose data into one's information base
- Use data adequately to achieve a particular reason

- **The difference between computer competency and computer literacy**

Computer competency includes applied learning identified with essential phrasing (with social, moral, and worldwide issues) and abilities important to perform assignments in word processing, databases, spreadsheets, introduction designs, and fundamental working framework capacities (Hindi, Miller & Wegner, 2010). Computer competency is the capacity to utilize computers at an appropriate level to create, report and work together in a proficient society (Son, Robb & Charismiadji, 2011).

Computer competency is connected to computer literacy and could be considered as a gathering of abilities relating to the utilization of fundamental data and technology innovation in a computer-based environment and in addition the information that identifies with the legitimate and moral issues and dangers of ICT use. The terms computer literacy, computer competency and computer information would be utilized conversely (Poelmans, Truyen & Desle, 2009).

Mason and Morrow (2006) characterized computer competency as mindfulness. The competency part was exhibited by the student's capacity to utilize application programming, a student who is technically skilled, but however needs mindfulness can't be said to be computer literate.

Computer competency is critical for accomplishment in the business world particularly in education. Computer competency is an advantageous instrument for students to use to coordinate into the educational program for all levels of student's academics. These days, students confront new difficulties which is crucial to their survival in the computer-based environment (Ikolo & Okiy, 2012).

Computer abilities positively affect all educational factors. Computer competency in connection with computer literacy can likewise be characterized as the information and

capacity to utilize computers and related innovation capably, with an assortment of aptitudes covering levels from basic use to programming and critical thinking. Anunobi (2004) portrayed computer competencies as having a clear comprehension of what computers are and how they can be utilized as a resource. Students' educational achievement rely upon having the capacity to apply specialized learning and to perform computer errands linked with their real connections to what they are studying (Grenci, 2013 & Gupta, 2006).

According to the researcher, computer literacy is the understanding of computer characteristics, proficiencies and applications, also the ability to apply this knowledge in a competent, productive use of the computer applications suitable to people's roles. Computer literacy also contains the feeling one has when using a computer, it could be a feeling of anxiety or that of being fully confident. On the other hand, the researcher perceives that computer competency is the knowledge and capacity to use computer applications (MS Word, MS Excel, etc.). Computer literacy and computer competency go hand in hand together, increasing computer competence can positively impact computer literacy.

- **Computer literacy world wide**

In New York a Times organization (2006) uncovered that in many regions of business a computer is a standard device. In the banking arena and in classroom contexts and additionally in libraries, the computer remains a standard apparatus that must be utilized and it is to the greatest advantage for students to have a sound education and knowledge of computer literacy.

Establishments of higher learning in Nigeria particularly the colleges had tried endeavours to uphold computer literacy amongst the students by presenting computer studies as a General Studies course which remains an essential requirement for graduation. In Nigeria computer literacy has turned out to be important to the point that students who don't approach computers and the web were probably going to get further behind their companions who approach computers. Numerous examinations in Nigeria are directed utilizing computer innovation. The National Open University which was opened to offer access for the individuals who couldn't get immediate affirmation in the standard colleges composed their examinations utilizing the computers. Most of the colleges have embraced the utilization of the computer in leading examination for the Post Unified Matriculation Examination. Plans have likewise been finished up to direct the Unified Admission and Matriculation Examination utilizing the computers. It turns into a need that students ought to be operational with computer literacy and computer competencies to have the capacity to work adequately in the growing world (Ngozi, 2014:2).

While computer literacy continues to develop in Western and Asian countries, African countries still experience a delay in its implementation and that continues to widen the computer knowledge and skills divisions. In a recent study by Kiptalam (2010), observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries. However, the results indicate that ICT has entered many sectors including banking, transportation, communications, and medical services, the Kenyan educational system seems to lag behind. Further, recent report by the National Council for Science and Technology (2010) indicated that computer use in Kenyan classrooms is still in its early phases and concluded that the perceptions and experiences of teachers and administrators do play an important role in the use of computers in Kenyan classrooms.

Computer literacy in education in Asia can be viewed from two very different perspectives. The first reflects a development discourse that explains the role of ICT in eliminating the digital divide by reaching the unreached and providing support to those who cannot access essential infrastructure, trained teachers and other quality educational resources. The second perspective adheres to an e-learning (online-learning) paradigm and is a response to the emerging knowledge society where ways of teaching and learning are evolving at a rapid pace to foster learner-centric educational environments, which encourage collaboration, knowledge creation and knowledge sharing (Kozma,2003).

In India computer literacy has progressed toward becoming a piece of the educational framework and life frameworks. Educators in India has convictions that the headway in the field of computer information encourages students to prevail in their academic learning (Gupta, 2016). They also encounter that students are feeling the crush and misperceive about computer literacy and its mindfulness. Suitable utilization of electronic data frameworks in educational foundations requires appropriate fulfilment of computer literacy abilities by students. Bernadette (2010) propels the view that diverse nations on the planet have shifted requirements for computer literate individuals because of the standards of social orders and the level of their computer skills. Taylor (2011: 29) observe that, “Acquiring computer skills is more important today than ever before, especially in a developing country”. While Mukti (2000: 1) states, with a specific end goal to utilize an instructional apparatus, for example, the computer to accomplish the objectives of educating and getting the hang of, encouraging must have satisfactory information about the computers.

In the United States (U.S) computer literacy is seen as having the basic expertise that is normal from guardians, higher education establishments, businesses and the more extensive network (Duncan-Howell, 2012). Sulaiman and Hui (2011) contend that even though

numerous students today are inundated with technologies, the term computer literacy alludes to computer capacities utilized as a part of advanced education and expert settings. As data turns out to be more available to everybody, digital ability, certainty and basic reasoning aptitudes of utilizing data and specialized apparatuses (ICTs) are normal in the workforce. Duncan-Howell (2012) say, there is a requirement for basic scholars equipped for utilizing innovation to adjust, advance, take an interest and willing to address difficulties in the worldwide economy of the 21st century. As technology turns out to be more overwhelming in training the desires of students' investigating and critical thinking abilities would rise simultaneously with those in the workforce in the USA (Jackson, Gaudet, McDaniel & Brammer, 2009).

In the U.S. there is a gap that has been identified between individuals who approach computerized innovation and the individuals who don't, and this is firmly connected to access to computers and internet use that could be inspected crosswise over financial status, ethnicity, and age. This computerized division contends that computer literacy isn't an extravagance yet a need, as technology influences about all parts of regular day to day existence (Machado-Casas, 2010). In the present data-based economy, computer literacy is a principal prerequisite for generally occupations.

Since numerous Latin American children don't have access to computers at home or at school, they are probably going to need computers and technology aptitudes, rendering them unfit for some occupations (Pruitt-Mentle, 2002). Besides the fact that technology is a focal point of the educational modules and computers are a focal medium for learning dispersion, in this way additionally limiting numerous Latinos without computer access at home. The significance of building up tertiary innovation organizations for Latina/o students and guardians that could enhance family dispositions, convictions and learning about technology (Machado-Casas, 2010).

The United States has set up a general and differing strategy intended to energize the utilization of ICT's in schools (Anderson & Dexter, 2009). To shape their educational modules and evaluations as indicated by the arrangement orders, states have for the most part taken up the National Educational Technology Standards set up by the International Society for Technology in Education (2007). The US National Education Technology Plan verifiably and unequivocally empowers the advancement of abilities that empower investment in the computerized age. Objective 1.1 of the arrangement focuses on that, paying little mind to the learning space, “… states should continue to consider the integration of 21st-century competencies and expertise, such as critical thinking, complex problem solving, collaboration,

multimedia communication, and technological competencies demonstrated by professionals in various disciplines" (Office of Educational Technology, US Department of Education, 2010).

Harris (2010) takes note that with the blast of web availability and progressively complex devices for dealing with data, the main legitimate assignments users can ask of students are assessment (of non-factual information sources) and making of unique work. He proposes that there is no reason for influencing students to remember actualities when data can just be discovered utilizing seek instruments. Working separately with computers the improvement of aptitudes for singular development of learning that constitute one of the fundamental focuses of present-day tutoring (Valiande & Tarman, 2011:178).

As indicated by educational researchers in Australia, computer literacy is one part of all the more extensively characterized computerized proficiency, which computer literacy includes the capacity to understand diagrams, pictures and moving pictures on a screen known as visual proficiency (Elkins, 2010) and to discover and examine data utilizing the computer and the web is known as the information literacy (Ryan & Capra, 2001).

In a few nations, young students assert that they take in more about utilizing computers out of school than they do in school (Thomson & De Bortoli, 2007). Grown-ups respect the new age of youngsters as "digital natives" (Prensky, 2011) who have created "sophisticated knowledge and skills with information technologies" and in addition taking in styles that vary from those of past ages (Bennett, Maton & Kervin, 2008: 777).

In Saudi Arabia most colleges and higher education establishment programmes contain computer literacy courses. The fundamental objective of these courses is to acclimate new students with essential computer applications aptitudes and to empower them to take a shot at Windows working framework condition and get the nuts and bolts of Microsoft Office (MS) applications, for example, MS Word, MS Excel, Outlook and PowerPoint. While at the same time these abilities proceed as a need for graduates to contend and secure future work (Keengwe, 2010: 169), the benefit of including a required computer literacy course in undergrad programs is currently getting to be dubious in Saudi Arabia.

In a global context, computer literacy is increasingly accessible and important, therefore most countries see computer literacy as a gateway for the raising of educational standards (Noor-UI-Amin, 2013). According to Halewood and Kenny (2008), India has adopted a program aimed at reconstructing the existing system of tertiary and vocational education through the integration of computer literacy tools to reinforce the acquisition of human capital. On the other hand, computer literacy differs from the above and will be discussed below.

- **Computer literacy in South Africa**

In South Africa a need for social transformation and economic development is used as the basis and justification for investments in educational reforms (Ang'ondi, 2010). South Africa has characteristics of both an advanced and a developing economy. It has access to technology; it has cultured institutions including research bodies and universities and it has a strong private sector and economic resources. At the same time, half of the 50million people in South Africa live below the poverty line and a large proportion of South Africans have weak educational qualifications. Due to the legacy of apartheid, the South African education is still facing development discrepancies between the urban and rural schools. Studies by Mlitwa and Nonyane (2008) and Mlitwa (2010) report that rural schools lack basic infrastructure such as classrooms, furniture and electricity. The majority of these schools lack libraries, books and other basic facilities needed to support the quality of education. With such an absence of essential framework in these country foundations, it is impossible that these institutions would have the capacity to obtain computers soon, not to mention coordinate all parts of ICT in the educational programs as conceived by the e-Education strategy. Except if these formative inconsistencies are tended to, the nature of education would remain bargained in influenced networks.

The South African Government's White paper defines the use of Information technology and communication (ICT) as "the convergence of information technology and communication technology. ICT is the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge" (Department of Education, 2004:15). South African education institutions in general and the FET colleges sectors in particular, are set to grow significantly in the ICT access, professional development and the use of it. However major challenges still need to be overcome, such as the lack of a comprehensive policy on ICTs in education that covers all sectors in education and the promotion of enhanced learning through optimal usage of all technologies as well as the need to demonstrate the value of the investment in ICTs through improved performance of students in the changing labour market (SA draft ICT in Education Implementation Plan, 2006).

E-learning is a learning system based on formalised teaching but with the help of electronic resources. While teaching can be based in or out of the classrooms, the use of computers and the internet forms the major component of e-learning. E-learning can also be described as a network enabled transfer of skills and knowledge and the delivery of education is made to a large number of individuals at the same or different times. Earlier, it was not accepted wholeheartedly as it was assumed that this system lacked the human element required in learning. E-learning has become a necessity in higher education institutions and is being arranged in educational institutions throughout the world. With the announcement of e-

learning technology, academics are facing the challenges of acquiring and implementing computer skills for the purpose of better learning. According to some distinguished researchers the internet is a perfect tool of learning that offers flexibility and expediency to students at the same time offering endless opportunities for innovate teaching (Wang, 2009; Hardaker and Singh, 2011; Macharia and Pelser,2012). Other researchers stated for some of the reason for e-learning success is that e-learning systems would likely to encourage student learning resulting in a higher level of student engagement (Hiltz, 1993; Wang and Wang, 2009). E-learning can be better than face to face learning, the quality of interaction and timely feedback is superior, with good course design can untangle the geographical limitations to education (Chen, 2006). The impact of e-learning on student achievement is complex and mediated by a range of other factors affecting achievement. It is clear, however, that:

- Their effectiveness is closely related to how the technology is used as an educational tool. Students learn best with e-learning when interactively engaged in the content. Using technology can motivate students, particularly under- achieving students, to learn.
- Educators report that tutorials in subjects such as math and science significantly improve student performance. Word processing software improves writing skills.
- Providing technology on its own has little impact on achievement. Substantial effort must be put into infrastructure, teacher training, curriculum development, assessment reform, and formative evaluation.

According to the Government gazette (2004), in the South African context, the concept of e-Education revolves around the-use of ICTs to accelerate the achievement of national education goals. e-Education is about connecting students and educators to each other and to professional support services and providing platforms for learning. By creating the e-Education policy South Africa is therefore taking a positive step to acknowledge and to redress the resource inequalities in its schooling system. Through its e-Education policy, in 2003 the government undertook to deploy and integrate ICT to curriculum in all schools. Integrating computer literacy into the curriculum therefore, implies the alignment of educational technologies with pedagogy. Computer literacy is therefore seen as a tool and an enabler of equal access to quality education (Wahab, 2006).

Accomplishing quality education is an issue for some nations including South Africa (African Development Bank Group, 2011; Independent Commission for Aid Impact, 2012) and brings about poor learning results of students (Organization for Economic Cooperation and Development (OECD), 2013). Since the progress to majority rules system in 1994, the South African government has been attempting to address the test of giving quality education to all students. It is a pressing issue because of South African students persistently low execution

in academic accomplishment (DBE Republic of South Africa, 2011:3), especially in computer literacy and mathematics, when contrasted with national educational module benchmarks and universal appraisals (DBE Republic of South Africa, 2011, National Education Evaluation and Development Unit (NEEDU), 2013).

Computer literacy abilities are imperative yet should be profitably incorporated into the educational modules if they have a beneficial outcome in education (Mlitwa, 2010). An educational program involves the rationality, the substance, the approach and the appraisal of the program of learning (Harvey, 2004). Incorporating computer literacy into the educational modules, hence, suggests the arrangement of educational technologies with improved teaching methods. In South Africa a requirement for social change and monetary advancement is utilized as the premise and legitimization for interests in educational changes (Ang'ondi, 2010). Computer literacy is in this way observed as an instrument and an empowering influence of equivalent access to quality education (Wahab, 2006). Thus, there has been a dynamic move during the time spent selection and circulation of computer literacy in education in South Africa (Farrell & Isaacs, 2007).

A more noteworthy issue is an absence of resources to give ICT training and specialized help in schools and universities (Bingimlas, 2009). Subsequently, there is a gap between the accessibility of ICT resources and equipped people to coordinate them into school educational program (Adebisi, 2008). Even though national governments all over Africa are finding a way to advance ICT in education, the mainland is tormented with poor institutional frameworks and resource imbalances (Farrell, 2007). By developing the e-Education policy, the South African government perceives the significance of computer literacy for teaching and learning. The objective of this strategy is to guarantee that each student can utilize computer literacy unhesitatingly and inventively to build up the aptitudes and information they must accomplish individual objectives (DoE, 2003).

Asan (2003: 153) states that:

" The use of computers in education opens a new area of knowledge and offers a tool that has the potential to change some of the existing educational methods. The teacher is the key to the effective exploitation of this resource in the educational system".

- **Different university policies in South African universities**

Part of the South African Government's strategy plan is to improve the quality of learning across the education and training system, the focus of the policy is on learning for a new generation of young people who are growing up in a digital world and are comfortable with computers (Department of Higher Education and Training (DHET), 2013). Further Education

and Training (FET) colleges have responded to the need that was identified by DHET for computer skills to improving their course offerings to include computer related subjects

South African universities have established the e-Education policy to ensure that every student is able to use ICT confidently and creatively to develop the skills and knowledge they need to achieve their personal goals (Government Gazette, 2004). As a fundamental aspect of e-Education, ICT is viewed as a resource for teaching and learning and an enabler of the development of the university as a whole. The main objective is to equip university students with ICT to improve learning; to facilitate curriculum incorporation; improve communication and engagement as well as collaboration between educators and between students (DoE, 2007).

In collaboration with the Departments of Communications (DoC) (ECT Act, 2002), and of Science and Technology (DST) (National system of innovation, 2002), the South African Department of Education (DoE) developed the e-Education initiative to stimulate the development of technical skills in education (Pandor, 2004). Through its e-Education policy, in 2003 the government undertook to deploy and integrate ICT to curriculum in all universities in South Africa. The main objectives are to provide ICT resources to support the development and distribution of electronic learning content, so as to ensure that every student, educator, manager and administrator has the knowledge, skills and support needed to integrate ICT in learning. To achieve this goal, the policy sets guidelines to advance student ICT competencies by integrating the use of ICT into the teacher pre-service and in-service training. It further pushes for universal access to ICT, through the deployment of networked computers, educational software and online learning resources to all universities in South Africa. Mlitwa (2010) adds, ICT facilities and ICT skills are important, but need to be productively integrated into the curriculum if they are to make a positive impact in education

A curriculum entails the philosophy, the content, the approach and the assessment of the programme of learning (Harvey, 2004). Integrating ICT into the curriculum therefore, implies the alignment of educational technologies with pedagogy. With these initiatives the government is taking steps in order to redress the resource inequalities facing the educational system in the country.

According to the South African Government's White paper policy, computer literacy is essential for all tertiary students, this implies that higher education level students have to be computer literate or alternatively the institutions have to offer programs to develop their computer literacy proficiency (Government Gazette, 2007).

Higher Education Institutions are striving to provide effective, flexible, convenient and accessible learning experiences to address the needs of a new generation of students entering

these institutions (Thomas, 2008). This generation of students has a keen interest in using technology and demand to use technology in teaching and learning, in and out of the classroom (De George-Walker and Keeffe, 2010). These students display technology-influenced aptitude, attitudes, beliefs and sensitivities (Oblinger, 2003). They define technology broadly, beyond the computer and the internet, to include the ability to adapt technology to meet individual needs (Roberts, 2005) They thus challenge academic staff members to utilise innovation in their delivery approaches. This has led to various institutions adopting blended learning as one of the approaches used for teaching and learning (De George-Walker and Keeffe, 2010; Dziuban, Moskal and Hartman, 2005).

According to the new e-education strategy 2013-2025, (2012), the implementation strategy for ICT in South Africa is guided and informed by the White Paper on e-education 2004. The outcome of the strategy will be to integrate ICT into all levels of the education and training system, in order to improve the quality of teaching and learning

The South African Government's White Paper on e-Education characterizes the utilization of ICT as the meeting of data innovation and correspondence innovation. ICT is the mix of systems, equipment and programming, and in addition the methods for correspondence, joint effort and commitment that empower the handling, administration and trade of information, data and learning (Department of Education, 2004:15). The South African White Paper additionally characterizes computer literacy as "the ability to appreciate the potential of ICT to support innovation in industrial, business, learning and creative processes" (Department of Education, 2004: 15). The strategy additionally expresses that advanced literacy is viewed as a fundamental ability like proficiency, numeracy and data proficiency, as the capacity to find, assess, control and convey data from various sources (Department of Education, 2004: 15). Anderson (2008) condenses the standards of ICT education for students as the utilization of advances for handling data and imparting, i.e. computer technology, interactive media, organizing, and particularly the Internet. Students ought to achieve six abilities:

- operating computers
- using computer applications
- integrating applications into educational programs
- evaluating applications
- designing new applications and
- programming of computer applications

- **Computer literacy in the subject computer practice**

Several countries across the globe are constantly faced with the challenge of improving the capacity of the workforce to respond to their national development needs and to the demands of a rapidly changing, more globally competitive world. In South Africa, FET colleges are regarded as a core component of the national development strategy. There are several factors in the operating environment that have created this situation.

The experience of the past few years has made the Government to appreciate that FET college programmes are essential for the improvement of the skills base of the country. The vocational programmes are intended to directly respond to the priority skills demand of the modern economy. There is a greater need for programmes that are relevant to South Africa's economic growth course. At certain Further Education and Training (FET) colleges, most of their business faculty courses has a Computer Practice subject. Students must be able to understand and work in Microsoft Word, Excel and Access. Each course has N4, N5 and N6 level. In N4 level students would be introduced to the computer practice N4 subject, it would benefit the students if they had Computer Application Technology (CAT) on secondary school. In N4 level students would learn and practice all the basics of the computer, only for MS Word and Excel. In N5 level they would go further into the MS Word and excel, the Ms Access would then also be added. The computer practice subject only covers the basics of a computer for example, students must be able to type letters and work on an excel spreadsheet.

Business today depends on several aspects of computer literacy. It's almost impossible to get ahead without computer skills. If you have a wide range of these skills, you'll be highly employable, in a multitude of positions, in any business. With completed computer practice N4 and N5 level at some FET college students must be able to do the following:

- Develop keyboard techniques to key in alphabet and numeric text, symbols and special characters
- Identify and remedy technique errors
- Apply keyboard techniques and ergonomic practices to avoid overuse injuries
- Produce sentences and paragraphs containing alpha and numeric text, symbols and special characters
- Identify the different storage devices on a computer
- Explain the concepts of files on a computer in a Graphical User Interface (GUI) environment
- Locate files in a GUI environment

- Work with computer files in a GUI environment
- Protect computer files in a GUI environment
- Demonstrate an understanding of the principles of word processing
- Create, open and save documents
- Produce a document from given text Format a document
- Edit a document
- Check spelling and grammar in a document
- Adjust the display characteristics
- Demonstrate an understanding of the principles of spreadsheets
- Create, open and save spreadsheets
- Produce a spreadsheet from given specifications
- Edit a spreadsheet
- Format a spreadsheet
- Check spelling in a spreadsheet
- Print a spreadsheet using features specific to spreadsheets
- Understand the concepts and terms of the internet
- Explain legal and ethical issues in relation to internet use

As we depend more on technology, computer literacy is an essential skill that is expected from parents, higher education institutions, employers, and the wider community (Duncan Howell, 2012; Harris, 2010; Jackson, Gaudet, McDaniel, and Brammer, 2009; Stuart, 2011; Sulaiman, Sulaiman and Wei Hui, 2011) Although many students today are familiar with technology, the term computer literacy in this study refers to computer skills, students need to use in higher education to be successful graduates.

Computer literacy may improve the knowledge and ability of students for higher academic performance and can also be referred to the comfort level someone has by using computer programmes and other application that are related to computers. It is essential for students to be computer literate in this computer based era. Computer literacy will boost student confidence, once students have the assurance of computer literacy skills they hold, their

confidence in using computers is boosted. Starkey (2010) shows that boosting ICT usage, learning increases computer developments and helps shape confidence.

In conclusion, for the purpose of this study the researcher made use of the following definition for computer literacy:

Computer literacy is the knowledge and ability to use computers and related technology efficiently with a range of skills covering levels from elementary use to programming and advanced problem solving (Ikolo & Okiy, 2011). Computer literacy also includes a feeling that on has when they work with a computer, it can be a feeling of fear, anxiety or fully confident and positive. By using this definition, the researcher then aimed to determine how self-regulation could explain the levels of computer literacy in the population of this study.

2.5 Self-regulated learning (SRL)

The rapidly changing nature of technology development and the increasing complex contexts in which education operates, force students to become competent at using computers. It also requires the development of such personal characteristics as self-reliance and commitment to ongoing learning about computer literacy, creativity and adaptability in approaching new technologies and their users, the ability to conceptualise computer literacy values and processes, motivation to sustain learning and the ability to monitor one's own thinking and learning approaches. These characteristics are also inherent in self-regulated learning (Zimmerman, 2001). Self-regulated learning refers to the ability of students to understand and control their learning processes and outcomes (Schraw, Crippen and Harley, 2006). Research has shown that self-regulated learning is an important aspect of student academic performance. Students practicing self-regulation behaviours initiate and direct their own efforts to acquire knowledge and skill rather than relying on educators, parents or others. In general, self-regulated learning consists of three essential elements: commitment to academic goals, self-efficacy perceptions and self-regulated learning strategies (Zimmerman, 1989).

Self-regulated learning in this chapter was determined by the nature of self-regulation as viewed by Zimmerman (2000). The way Zimmerman views self-regulated learning from a social cognitive perception, social cognitive theory is discussed, where after self-regulated learning is defined from a social cognitive perception, followed by a discussion of Zimmerman's (2000) model of self-regulation. The importance of self-regulated learning is highlighted by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world (Zimmerman, 2002: 64).

In today's information reliant society, it requires one to be a flexible and independent individual that is able to manage the transmission of a huge volume of information. Researchers have noted that the goal of higher education is to faster students to become capable, independent, self-regulated and efficient students (Pintrich and De Groot, 2000). One of the main aims is for students to become responsible, effective, independent and confident for their own learning. An efficient learning process is a critical factor in higher education in the sense that it may provide innovative technological approaches, such as learning tools in order to define strategies that would enable students to manage their own learning (Povatong, 1999).

2.6 Social Cognitive Theory

This study is rooted in the work of Bandura (1986) and social cognitive theory. Social cognitive theory states that "social" refers to the human interaction interlaced with emotions, thoughts, actions and its role in motivation, while "cognitive" refer to processes of self-observation, evaluation and its role in motivation. Bandura, who developed social cognitive theory, views a person as self-organised, proactive, reflective and self-regulated. The social cognitive theory will also address how instructions can apply the views to assist in the acquisition of computer literacy skills. Since Bandura's initial publication on social cognitive theory the electronic era has created new methods of disseminating information. Education is also undergoing a shift as curriculum developers attempt to adapt to the needs of 21st century students.

In order to understand the instructions of computer literacy skills, a 21st century application of the social cognitive learning theory sets the instruction through the use of technology (Lui, 2010). In this study, social cognitive theory of human functioning, emphasises the ability for one to be in control of one's own outcomes, self-efficacy and the belief that one can achieve those outcomes. According to Lui (2010), transferring these beliefs to the use of technology can help determine if a student is going to be successful learning with technology tools. In order to use technology tools confidently for maximum learning potential, it helps for users to be comfortable with their computer literacy skills.

The rapid and ever changing advances of technology are changing the way students relate with the world. Bandura (2002) stated that technology plays a large role in the globalization of human interconnectedness, thus influencing how students use and apply technology within their societal and cultural environments. Since learning environments are changing to include readily accessible technology and all the boundless resources associated with technology, it is only inevitable that educational theorists re-evaluate their learning theories so they are applicable to how individuals are influenced by technology in the learning process.

Bandura (2002) states that “any theory of human adaptation and change in the electronic era must, therefore, consider the dynamic interplay of technological developments and a variety of psychosocial and structural determinants”. It has been established that social cognitive theory senses a perspective to its framework that suggests students are motivated to act and make choices or decisions to be in control of their worlds. However, in order to make sound decisions, especially in the face of adverse challenges, individuals must have a strong sense of self-efficacy. The stronger the perceived self-efficacy the higher the goal challenges people set for themselves and the firmer their commitment to them (Bandura, 2002:3). In order for individuals to not be overwhelmed by the excess of information available on the Internet, they will need a strong sense of self-efficacy and the motivation to persevere. High self-efficacy and high motivation are necessary for students in order for them to be successful and productive.

Bandura (1999) recognizes that individuals have the complex mental ability to make choices and be a part of the world, essentially, they are responsible for their own life course influenced by their surroundings. Cognitive development is necessary for students to self-determine their outcomes. The mind does not simply react to the events of one’s surroundings, but the mind also develops cognitive abilities that enable individuals to adapt, adjust and to function in a dynamic world (Bandura, 2000). Bandura (1999:23) states that cognitive processes are not only emergent brain activities, they also exert determinative influence. The human mind is generative, creative, proactive, and self-reflective not just reactive. People operate as thinkers of the thoughts that serve determinative functions. They construct thoughts about future courses of action to suit ever-changing situations, assess their likely functional value, organize and deploy strategically the selected options, evaluate the adequacy of their thinking based on the effects which their actions produce and make whatever changes may be necessary.

The basis of Bandura’s (1986: 18) social cognitive theory is that human functioning is the product of a dynamic, reciprocal and triadic interaction between personal (e.g. student’s knowledge, metacognition, motivation and anxiety), behavioural (e.g. self-observation and self-reaction) and environmental variables (e.g. academic outcomes, modelling and feedback from educators) (see Figure 1.1). Computer literacy skills are essential for all students to learn in order to adapt, learn, grow and be successful in the technology era.

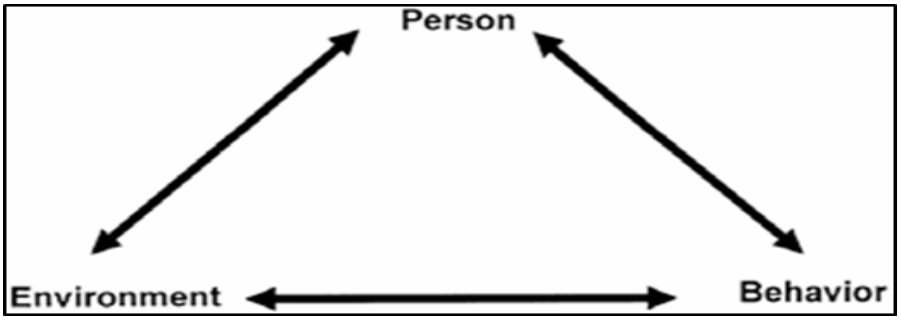

Figure 2.3: The relationship between the three classes of determinants in triadic reciprocal causation (Bandura, 1986: 24)

Bandura's Social Cognitive Theory (1986) is built on the Social Learning Theory, views of response consequences, distanced learning and modelling of behaviour (McCormack, 1999). Social cognitive theory used in student learning, holds that portions of an individual's knowledge acquisition can be directly related to observing others within the perspective of social interactions, experiences and other influences. People observe others by performing a behaviour and the consequences of that behaviour, they remember the sequence of the events and use the information to guide the subsequent behaviours (Bandura, 2002).

Bandura (1986: 18) states that the capacity to symbolise makes one uniquely human. An unexpected capacity for symbolization provides humans with a powerful tool for understanding their environment and creating and regulating environmental events touch virtually every aspect of their lives. Most external influences affect behaviour through cognitive processes rather than directly (Bandura, 2001). Through symbols, people give meaning, form and continuity to their experiences. Individuals gain understanding of unplanned relationships and expand their knowledge by operating symbolically on the wealth of information resulting from their personal and vicarious experiences (Bandura, 1989:9).

Related to a student's ability to generate meaning from symbols, is the ability to exercise forethought. Bandura (1986: 19) states that the forethought capability is rooted in symbolic action, it allows students to motivate and monitor their actions, anticipatorily. Students do not merely react to their environment, nor are they simply ruled by their experiences. Rather, their behaviour is purposive and regulated by forethought (Bandura, 1986: 19). A student's ability for forethought is also embedded in self-regulatory mechanisms which give rise to expectancies and the ability to evaluate an anticipated outcome (McCormack, 1999).

Social cognitive theory gives rise to three assumptions that concern the reciprocal character of the influences between personal, behavioural and environmental variables, enactive and vicarious learning, and learning and performance (Pintrich & Schunk, 1996: 160). Human behaviour has often been described in terms of unidirectional causation, in which behaviour formed and controlled either by the environmental influences or by internal character. Social

cognitive theory explains psychosocial functioning in terms of the triadic reciprocal causation (Bandura, 1986). In this transactional interpretation of self and environmental, personal factors in the form of cognitive, emotional and biological actions, behavioural patterns and environmental events all operate as interacting determinants that influence each other bidirectionally (figure 1.1).

As shown in figure 1.1, because of these joint, reciprocal influences under social cognitive theory, students would at the same time be both products and producers of their motivation, their respective environment and their behaviours. In social cognitive theory, the triangular influences among the person, environment and behaviour do not essentially specify balance in the strength of the bidirectional influences. An example of the above, if all three factors are present in a learning environment, it does not mean that all three has equal and simultaneous influence on the student. Bandura (1986:24) provides the following example:

"If people are dropped into deep water, they will all promptly swim however uniquely varied they might be in their cognitive or behavioural repertoires... On the other hand, if a person plays piano for his or her own enjoyment, such behaviour is self-regulated over a long period of time by its sensory effects and cognitive and environmental influences are involved in this process by a lesser extent... finally, in deciding what book to check from the library, personal preferences hold the sway."

2.6.1 Triadic forms of self-regulation using self-oriented feedback loops

By using the social cognitive theory of reciprocal determination (see Figure 1.1) as a foundation, Zimmerman (1990:5) highlights the constantly changing factors inherent in the behavioural, environmental and personal aspects of self-regulation. Self-regulation is described as cyclical because the feedback from prior performance is used to make adjustments during current efforts. Such adjustments are necessary because personal, behavioural and environmental factors are constantly changing during the course of learning and performance and it must be observed or monitored by using the three self-oriented feedback loops (personal, behavioural and environmental). Self-orientated feedback loops occur when students monitor their use of learning strategies and adjust their behaviours accordingly (Zimmerman, 2000a: 14) if necessary.

Zimmerman (2000a: 14) distinguishes between three forms of self-oriented feedback loops: behavioural, environmental and covert self-regulation. Behavioural self-regulation involves self-observing and strategically adjusting performance processes, such as students' method of learning. According to Zimmerman (1990a: 5) it also relies on the self-orientated feedback loop as the cyclic process in which students' monitor the effectiveness of their learning

strategies and react to this feedback in a number of ways, whether it be covertly or overtly. When attempting to prepare for a practical assignment, a student may use a self-evaluation strategy (i.e. read through the notes made in class or practice previous exercises on the computer) that will provide information about accuracy and manipulation functions, which one would benefit the student most. If the student realises that practicing on the computer is more proactive than reading, the student would then adjust his/her preparation style. In this reciprocal depiction causation is personally initiated, implemented through the use of strategies and enactively regulated through perceptions of efficacy, thus self-efficacy serves as a sort of control that regulates strategic efforts to acquire knowledge and skills through a cybernetic feedback loop (Carver & Scheier, 1981).

Environmental self-regulation refers to a student's ability to observe and then adjust the environmental conditions or outcomes in order to maximise his/her learning activities (Zimmerman, 2000a: 14) (i.e. Leaving a noisy environment and moving to a noiseless room to learn effectively). A student's proactive use of an environmental strategy that contains an adjustment in behaviour requires that the actual behaviour of the student be changed in order for learning to be effective. The constant use of prepared setting for learning would be contingent on the student's observation of its effectiveness in assisting learning. This would be conveyed reciprocally through an environmental feedback loop (Zimmerman, 1989b: 330). If the student found it too noisy (i.e. the noise of fellow students in student centre) to study effectively then he/she would move to a quieter area (i.e. the library). Although learning strategies can be introduced from the environment (i.e. through instructions), according to the preparation, they would not be labelled as self-regulated unless they came under the influence of key personal processes (i.e. goal-setting and self-efficacy perceptions).

Covert self-regulation involves monitoring (i.e. rereading a paragraph and checking for spelling and grammar mistakes) and correcting cognitive and affective states (i.e. correcting spelling errors found in document) (Zimmerman, 2000a: 14). As monitoring is a metacognitive process, it has an effect on other personal processes, as the use of these processes are reciprocally regulated through a covert feed-back loop (Zimmerman, 1989b: 330). The accurateness and constancy of a student's self-monitoring of these triadic sources of self-control directly influence the efficiency of his/her strategic corrections and the nature of his/her self-beliefs. Covert self-regulation depends on the give-and-take nature of the triad. This shows that a student's covert processes reciprocally affect each other. The self-orientated triadic feedback loop is assumed to be open as it functions proactively in order to increase performance by raising goals and seeking more challenging tasks (Zimmerman, 1990b: 5; 2000a: 14).

Using Bandura's (1986) idea of triadic reciprocality as a foundation, Zimmerman (1989b: 329) circulated the idea that in order to meet the criteria of being self-regulated, 'a student's learning must involve the use of specific strategies to achieve academic goals on the basis of self-efficacy perceptions'. Self-regulated learning is an active productive procedure, in order for students to set aims for their academic learning, monitor and control their perception, motivation and behaviour, directed and self-conscious by their determinations and the background elements of the environment (Nicol and Macfarlane-Dick, 2006). Self-regulation strategies help students to operate the computer in order to achieve academic goals. Self-regulation plays the key role in the learning process and in regulating internet usage. Students achieve their own goals it they control and manage their tools with regulated learning (Yang Kim, 2009). Hargis (2000) also viewed that understanding of the interaction between the students' learning strategies and motivation and technology can provide insight into helping students improve academic achievement.

According to the social cognitive perspective there are four distinct stages of development regarding self-regulated strategies (Puustinen & Pulkkinen, 2001: 278; Zimmerman, 2000a: 29). Zimmerman believes that students' starts the self-regulatory process by observing a skilled model. Observation of competent models also motivates students to change from observing to emulating their actions and then progressively gain self-control until the point of reaching the independent level of self-regulation. In Zimmerman's description of the development of self-regulation the students have tasks and responsibilities. The four levels of development are: observation, emulation/imitation, self-control and self-regulation.

- Observation involves the students' ability to perceive and retain the patterns of the behaviour demonstrated by the educator.
- Emulation/imitation involves the students' determinations to repeat the patterns of behaviour observed under the direct instructions of the educator, it leads to feedback concerning the success or failure of the attempted strategy. At this level, students actively participate in imitation and simulation of the skills, strategies, methods, and processes displayed by the educator.
- Self-control involves the students' challenges to produce the observed behaviour under minimal direction from the educator. The educator remains available to provide feedback when it is needed with limited supervision while the students' challenge is to repeat the behaviour. At this level, students actively employ skills to reproduce the observed behaviours according to their own competency and skills.

- Self-regulation involves the students' attempt to reproduce the observed behaviours independently. Under interrelated situations, environments and with the assistance of the educator only when it is totally necessary, the student applies the newly acquired strategy. The educator remains available to provide feedback when it is required or requested. The students are challenged to continue adapting and transmitting the newly learned skills to different settings and conditions. At this level, students self-regulate their behaviour, skills and motivation to produce the observed behaviour in different situations and based on their own adjustments and competency.

Since Bandura's (1977) introduction of social cognitive theory explaining how students acquire competencies, skills, dispositions, beliefs, and self-regulation, educators and researchers have increasingly applied his theory to different aspects of learning and development (Bembenutty 2013; Boekaerts 2000; Corno 1993; Winne 1997; Zimmerman and Schunk 2011). Self-regulation of learning refers to students' self-generated thoughts, feelings, and actions that are systematically designed to affect learning of knowledge and skills (Zimmerman 2000). Zimmerman construes self-regulated students as individuals who are cognitively, motivationally, and behaviourally active participants in their own learning process. During the last few decades, self-regulation of learning has acquired a pivotal role in all areas of learning including sport and academic learning and technological disciplines (Azevedo, 2007 & Bembenutty, 2013).

Models of self-regulation which forms part of the social cognitive theory, define self-regulated learning as a goal-orientated process that emphasises the constructive and self-regulated character of self-regulation (Muis, 2007:175). Models within this social cognitive framework e.g. Bandura's Social Cognitive view of self-regulation (Bandura, 1986), Boekaert's Model of Adaptable Learning (Boekaerts, 1999), Pintrich's General Framework for Self-regulated learning (Pintrich, 2000), Schunk's Social Cognitive Theory and self-regulation (Schunk, 1989) and Zimmerman's Social Cognitive Model of Self-regulation (Zimmerman, 2000a) suggest that monitoring, regulating and controlling one's learning include cognitive, motivational and social factors.

- **Definitions of Self-Regulated Learning**

Bandura (1977) introduced the concept of self-regulation as part of human agency and exercise of control. To Bandura, self-regulation encompassed an essential component of humanness with self-control of individuals over their situations, environments, and contexts. Individuals are not subjected to stimulus control, rather they exercise cognitive, emotional, and behavioural power over their surroundings. Human thought, affect and behaviour are influenced by the ways in which events are construed and depend upon beliefs. Bandura

posited that individuals are not just reactors to external stimuli, but that they exercise influence over their environment and own behaviour (Bandura 1977).

Zimmerman (2000) has successfully applied the concept of self-regulation to academic contexts. According to Zimmerman (2000), self-regulation of learning is a fundamental element for all academic enterprise and success. Self-regulated students engage in actions, thoughts, and behaviours in order to pursue determined tasks. They do so by identifying goals and strategies and by monitoring and evaluating them. Over the past decades, scholars and educators have consistently demonstrated the efficacy of self-regulation on enhancing learning and sustaining goals over significant periods (Pintrich and De Groot 1990).

From a social cognitive perspective, Schunk (1989:83) and Pintrich (2000:453) assign a prominent role to goal-setting in their definitions of self-regulated learning. Schunk (1989:83) defines self-regulated learning as 'learning that occurs from students' self-generated behaviours systematically orientated toward the attainment of learning goals, while Pintrich (2000:453) states that 'self-regulated learning is an active, constructive process, whereby learners set goals for their learning, and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of their environment'.

De Corte, Verschaffel and Op 'T Eynde (2000) have proposed that self-regulated learning is not just an important set of skills that help students reach achievement goals, but is "in itself, a main goal of a long-term learning process". Most researchers agree that self-regulated learning is the strategic, intentional process of metacognitive monitoring and control in order to achieve a personal goal (Winne & Perry, 2000; Zimmerman, 2000). Most also agree that self-regulated students enact these monitoring and control processes across the domains of behaviour, motivation, cognition, and emotion (Cleary, 2006; DeCorte, Verschaffel, & Op'T Eynde, 2000; Pintrich, 2004; Zimmerman, 2000).

Significant to these definitions is the importance of self-determined beliefs and the responsibility to reaching academic and personal goals. Schunk's (1989), Pintrich's (2000) and Zimmerman's (2000) definitions are based on Bandura's earlier personal agency design and are rooted in the social cognitive theory of reciprocality. The importance of the self-orientated feedback loop is in Zimmerman's (2000:14) definition. Schunk (1989:83) refers to systematically orientated behaviours and Pintrich (2000:453) refers to monitoring of behaviours, which also refer to the reciprocal nature of self-regulation. The significance in Pintrich (2000:453), Schunk (2000b:633) and Zimmerman's (2000:14) definitions of self-regulated learning, is on proactivity. Students who are proactive, are aware of their strengths and weaknesses because they are guided by personally set goals and task related strategies

(Pintrich, 2000: 453; Schunk & Ertmer, 2000: 633; Zimmerman, 2002: 66). Zimmerman (1989b: 331) and Schunk (1989: 88) note that self-regulation contains three sub-processes: self-observation, self-judgment and self-reaction. These sub-processes contain an analysis of the triadic account of self-regulation, where personal influences are assumed to be influenced by environmental and behavioural pressures (Zimmerman, 1989a: 11).

Characteristic in these social cognitive definitions of self-regulation is the point that a student's behaviour is motivated and regulated by a set of internal standards and self-evaluative reactions, to these standards. These standards and evaluative reactions begin with self-observation, a bidirectional process, between internal standards and evaluative reactions, by which a student evaluates his/her own behaviour (Bandura, 1986: 336). An example of this would be when a student engages in self-observation of his/her ability to complete a computer practice test. By using a set of internal standards (e.g. I am able to apply manuscript signs and edit a word processing document), he/she is then able to use evaluative reactions (e.g. I edited the document according to the manuscript signs accurately, so I am now able to type a word processing document), to determine the success or failure of their attempt to edit and type a word processing document. Having a personal set of standards will allow the student to judge his/her own behaviour (Bandura, 1986: 340), while the development of evaluative standards and judgemental skills establishes a student's capability for self-reflective influences (Bandura, 1986: 350). The manner and degree to which students self-regulate their own actions and behaviour involve the accuracy and consistency of their self-observation and self-monitoring, the judgements they make regarding their actions, choices and attributions, and, finally, the evaluative and tangible reactions they make to their own behaviour through the self-regulatory process (Pajares, 2002).

For the purposes of this study, Zimmerman's (2000:14) definition of self-regulation will be implemented. This definition states that self-regulation is the 'self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals'. The cyclical nature of self-regulation as addressed by Zimmerman in his definition and his discussion of self-orientated feedback loops lends itself to an analysis of the self-regulatory aspects of computer literacy. This study aims to define the ability (i.e. through quantitative surveys and questionnaires and qualitative interviews) that an individual has to change his/her situational (i.e. physical setting), performance (i.e. ability to edit a word processing document) and individual (i.e. goals linked to computer literacy skills) variables and relations, reciprocally, in order to comprehend the goal of creating an understandable word processing document.

Own definition of Self-Regulation of Learning

Self-regulation of learning alludes to students' self-created reflections, sentiments and activities that are efficiently intended to influence learning of information and abilities. Zimmerman (2000), understands self-regulated students as people who are intellectually, motivationally and behaviourally dynamic members in their own particular learning process. Amid the most recent couple of decades, self-regulation of learning has procured a significant part in every aspect of getting the hang of including game and scholarly learning and innovative controls (Azevedo, 2007 and Bembenutty, 2013).

SRL according to the researcher, alludes to the learning methods that attention on how students oversee and connect effectively in their own learning, to acquire abilities and information, have the capacity to settle on their own choices and take care of issues through getting to controlling and applying existing learning.

2.6.2 Zimmerman's three phase cyclical model of self-regulated learning

Zimmerman (2008) developed Bandura's concept of social cognitive theory and self-regulation further by distinguishing three cyclical phases of self-regulated learning: forethought (goal setting, strategic planning, self-efficacy thoughts, goal orientation and intrinsic interest), performance (attention focussing, self-instruction and self-monitoring) and self-reflection (self-evaluation, attributions, self-reactions and adaptivity) (Puustinen & Pulkkinen, 2001:277; Zimmerman, 1990; Zimmerman, 1998:4; Zimmerman, 2002). For the purposes of this study, the researcher used the model proposed by Zimmerman (2000a:16) of self-regulated learning as a way of explaining how the three phases of forethought, performance and self-reflection are cyclically maintained and adjusted.

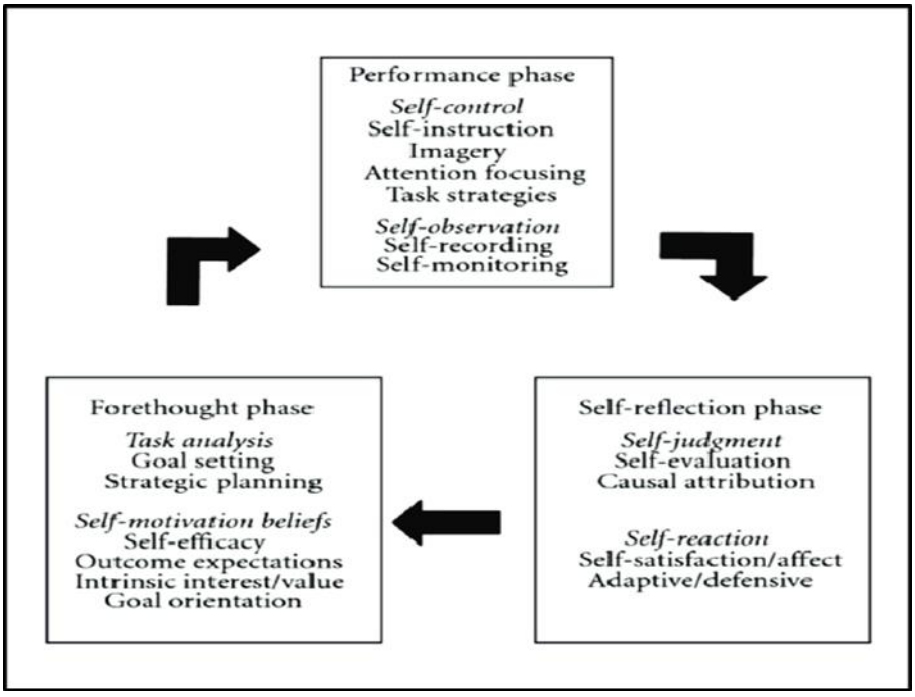

Figure 2.4: Cyclical phases of Self-regulation (Zimmerman, 2002:67)

Zimmerman theorised self-regulation as a cyclical process with three phases: forethought, performance, and self-reflection. The phases are cyclical, each process within each phase of self-regulation influences the next one. For instance, after students have engaged in self-reflection, they continue the cycle in forethought with a new task or a revision of the previous one. Given the level of performance, the students adjust and adapt their actions, behaviour and beliefs while beginning a new similar task. As Kitsantas and Dabbagh (2010) observed, "The cycle of learning promotes individual empowerment, in part because it reinforces the beliefs of the individual in his or her ability to effectively control aspects of the learning experience toward a desired outcome". In a similar vein, Zimmerman (2000) describes the structure of self-regulatory systems in these terms:

From a social cognitive perspective, self-regulatory processes and accompanying beliefs fall into three cyclical phases: forethought, performance or volitional control, and self-reflection phases. Forethought refers to influential processes that precede efforts to act and set the stage for it. Performance or volitional control involves processes that occur during motoric efforts and affect attention and action. Self-reflection involves three phases that occur after performance efforts and influence a person's response to that experience. These self-reflections, in turn, influence forethought regarding subsequent motoric efforts—thus completing a self-regulatory cycle.

2.6.2.1 Phase 1: Forethought

The forethought phase relates to beliefs and processes that occur before students' attempts to learn. This phase leads to the actual performance, it sets the stage for action and helps to develop a positive mind set. The ability to have forethought about actions enables students to motivate and guide their actions, in an anticipatory manner (Zimmerman, 2000a: 16). This anticipation gives rise to positive expectations and evaluations of expected outcomes (McCormack, 1999). Goals must be set as thorough outcomes, arrange in order from short-term to long-term. Thinking about an action requires a student to analyse the task ahead by setting goals regarding the task and by development a plan to reach these goals (Pintrich, 2000: 454). According to Zimmerman's Social Cognitive Model of Self-Regulation (2000), the ability for forethought action is rooted in self-regulatory sub-processes (Zimmerman, 2000a: 16) which involves two main processes: task analysis and self-motivational beliefs.

Task analysis involves goal setting and strategic planning. There is considerable evidence of increased academic success by students who set specific goals for themselves. Imperative to analysing a task is the capability to set goals. Goal setting refers to deciding on specific outcomes of learning and performance (Cleary & Zimmerman, 2004: 538). The goal systems

of highly self-regulated students are organised hierarchically, so that proximal goals operate as proximal regulators of more distal outcome goals (Zimmerman, 2000a: 17). According to Zimmerman (2000:17) when a student begins strategic planning, the first thing to do would be to select techniques that are appropriate for the task at hand and the setting, as well as suitable methods for attaining the goals set. These methods will enable the student to master or perform a skill optimally (Lubbe, Monteith, & Mentz, 2006: 283). The student will then select specific self-regulative strategies which are purposive processes directed at acquiring the task or skill at hand (Zimmerman, 1989b: 329).

Self-motivational beliefs arise from students' beliefs about learning, such as self-efficacy beliefs, outcome expectations, intrinsic interest or value and learning goal orientation (Zimmerman, 2000a: 17; 2002: 68; Zimmerman, Bandura, & Martinez-Pons, 1992: 673). (Hammann, 2005: 17). Pintrich (1999: 467) and Yen, Bakar, Roslan, Luan & Rahnam (2005: 350) conducted research which emphasized the importance of motivation in self-regulated learning. The greater the motivation and self-regulation of students, the higher the academic achievement produced by those students (Zimmerman, 2000b: 88).

Belief in one's ability to successfully complete a specific task is known as self-efficacy. Self-efficacy is important because of its two-fold outcome on the other mechanisms of self-regulation. Not only does self-efficacy influence the type of goals students set for themselves but it also affects the amount of effort they invest in working towards these goals (Pintrich, 1995). Previous research shown that student behaviour can often be better predicted by their beliefs about their capabilities than by what they are truly capable of achieving. Student's beliefs can also help determine what they do with the knowledge and skills that they have (Pajares and Miller, 1994). Students with high self-efficacy are confident in their skills and abilities to do well and have been shown to participate more in learning activities, show grater effort and persistence, and achieve higher levels of academic performance than students with low self-efficacy (Pintrich and De Groot, 1990; Schunk, 1991). Zimmerman (2000a: 18; 1992: 674) states that the link between self-efficacy and goal setting cannot be ignored. A student's perceived efficacy to accomplish motivates his/her academic attainment by influencing personal goal setting, and self-efficacy, in cycle with goal setting, contributes to a student's academic achievement. The more students judge themselves to be, the more challenging goals they set themselves (Zimmerman, 2000b: 87). Self-efficacy can be understood as the basis on which a student's performance is created. Lack of self-efficacy has also been associated with the debilitating effect of high test-anxiety (Pajares, 2002).

Outcomes expectations refers to a student's belief about the subsequent outcome of his/her performance (Pintrich et al., 1996: 177; Zimmerman, 2000a: 17). According to Zimmerman et

al. (1992: 672), outcome expectations in the form of anticipatory social and self-evaluative consequences operate as significant contributions to personal attainments. If a student believes that the final outcome of a performance is rooted in performing brilliant, this should provide an intrinsic motivation to perform to the best of his/her ability (Zimmerman, 2000a: 18).

Pintrich and de Groot (1990: 37) states that intrinsic interest or value is strongly related to the use of cognitive strategies and self-regulation. Riveiro, Cabanach & Arias (2001: 570) and Rozendaal, Minnaert & Boekaerts (2001: 284) found in their research that females are more intrinsically motivated and self-regulated than males. It has also been found that task value beliefs, of which intrinsic value is a component, are positively related to self-regulated learning (Pintrich, 1999: 467). Intrinsic motivation is also linked to the way students approach performances i.e. his/her goal orientation.

Goal orientation is characterized by goal orientation theories as two different orientations, mastery goal orientation and performance goal orientation (Schunk, Pintrich and Meerce, 2010: 184). Mastery goal orientation focus on learning, mastering the task according to self-set ethics or self-improvement, developing new skills, improving skills, trying to complete something challenging and trying to gain understanding or insight, on the other hand performance goal orientation focus on demonstrating competence or ability and how ability is judged relative to others (Schunk, 2010: 184). The process of goal orientation sustain motivation and improve achievement and performance better than an outcome goal orientation (Zimmerman, 2000a: 18) as it is the valuing of the process of learning for its own merits (Zimmerman, 2002: 68). The forethought processes have an impact on student's propensity and ability to engage in the performance phase (Cleary, 2004: 538).

2.6.2.2 Phase 2: Performance

This phase covers the progressions during learning and the active challenge to apply specific strategies to help a student become more successful. The performance phase also contains two sub-processes; self-control refers to the deployment of specific methods or strategies that were selected during the forethought phase. Among the key types of self-control methods that have been studied to date are the use of self-instruction, imagery and attention focusing, and learning/task strategies. Self-observation on the other hand as the second sub-process, refers to self-recording and self-experimentation to find out the cause of the events. Self-control is seen as one of the most important components of self-regulation and includes all the processes necessary to complete a task and attain goals (Zimmerman, 1998: 2).

Self-instruction, is a clear description on how to continue as one implements a task (Zimmerman, 1998: 4; 2000a: 18), while including descriptions of how the student describes to him/herself, the manner in which the task should be executed (Zimmerman & Risemberg, 1997: 117). Even though a student describes how to proceed with a task, Zimmerman (2000a: 19) recommends two more processes which can benefit a student with self-control, using imagery and focussing attention. There are many ways in which students can use self-instruction as a self-regulatory strategy (Alderman, 1999:131). Self-instruction can be used:

- as a volitional strategy to remind oneself to concentrate on work
- to remember steps in academic tasks like problem solving
- to control attention and on task-behaviour
- to cope with anxiety and failure, and
- as part of attribution retraining.

The imagery self-control technique is used when a student collects or organize information and leads to active learning when used in combination with other forms of information coding such as the use of graphic diagrams used to explain a concept (Zimmerman, 2000a: 19). Attention focusing can be perceived as tactics students use to improve their concentration and block out other external measures (Zimmerman, 2000a: 19). Previous mistakes together with the negative thoughts involved to these, does affect the attentional focusing techniques (Zimmerman, 1998: 3). Schunk (2000:128) views attention focusing as a necessary precondition for learning. If a student can use the above-mentioned techniques to control the level of his/her performance, the next process in the performance phase of Zimmerman's model (2000) provides the concrete application of strategies to aid in this control.

Task strategies supports the student in reducing the task to manageable parts and empowering a student to organise the performance successfully (Zimmerman, 2000a: 19). Essential to the performance phase of Zimmerman's Social Cognitive Model of Self-regulation (2000) is the inclusion and practice of task or learning strategies by a student. Task strategies assist learning and performance by reducing a task to its essential parts and reorganising the parts meaningfully (Zimmerman, 2000a: 19). In order to meet the requirements to be self-regulated according to Zimmerman (1989b: 329) students should include the use of detailed strategies to achieve their academic goals on the basis of self-efficacy perceptions.

Self-observation as the second type of performance (Zimmerman, 2000a: 19), refers to the tracing of specific aspects of the students' performance, the circumstances around it and the effects that it produces. Self-recording is a mutual self-observational processes that can

increase the proximity, in formativeness, accuracy and valence of feedback. Self-recording is a record of cognitions being monitored by a student (Alderman, 1999:132). Self-recording is a general self-observational process that can greatly increase the proximity, informativeness, accuracy, and worth of the feedback. Records can capture personal information at the point that it occurs, structure it to be most meaningful, preserve its accuracy without the need for intrusive rehearsal and provide a data base for discerning evidence of progress (Zimmerman, 2000a: 20).

Self-observation also speaks of self-recording personal events or self-experimentation to find out the cause of these events. When self-observation of normal differences in behaviour does not provide important analytical information, students can take on personal experimentation by increasingly changing the aspects of their functioning that are a problem (Zimmerman, 2000:21). For example, students are often asked to self-record their time use to make them aware of how much time they spend working on an practical task or assessment, a student may notice that when he/she practice individually, he/she finished the task more quickly than when practicing with a friend.

To test this theory, the student could conduct a self-experiment in which he practices similar tasks alone and in the presence of his/her friend to see whether his/her friend was an asset or a liability. Self-monitoring is a covert form of self-observation, it refers to one's cognitive tracking of personal effectiveness, such as the frequency of failing to meet the number of words for a speed test. Efficient self-observation using self-experimentation, can lead to greater personal understanding and to better performance (Zimmerman, 2000a: 21). This second phase of performance is extremely important, the student gathers information that will finally be used to evaluate the effectiveness of the strategic plan and to improve further learning challenges (Cleary, 2004).

2.6.2.3 Phase 3: Self-reflection

The self-reflection phase consists of two major stages, self-judgement and self-reaction, these stages refers to comparing one's self presentation against some principles and rules. Social cognitive researchers view self-regulation as a domain-specific level of acquired skill that depends on several task-dependent processes, such as planning, strategizing, developing motoric proficiency and self-monitoring (Schunk, 1997: 199). Self-reflection requires a paradigm shift on the part of the student, in order to change behaviours (from old behaviours to new behaviours), so that self-regulation in learning can occur (Bandura, 1989: 60; 2001: 4). This paradigm shift allows individuals to analyse and reflect on their experiences and to think about their own thought processes (Bandura, 1989: 58; 2001: 4; McCormack, 1999). Schunk and Ertmer (2000: 645) advise that self-reflective practice should be researched more

thoroughly in order to motivate students to get involve in self-reflection in order to realise the full potential of this central component of self-regulation.

Zimmerman (2000a: 21) states that self-judgement includes self-evaluating one's performance and attaching fundamental significance to this performance. Self-evaluation refers to linking self-monitored information with a goal. In the end, the adaptive value of one's self-reactions depends on the sensitivity of his/her self-judgements and knowing this, experts set challenging criteria for themselves (Zimmerman, 2000a: 21). Self-evaluations allow students to judge how well they complete an task by systematically comparing that performance against detailed mastery standards, earlier levels of behaviour or against the performance of others (Cleary & Zimmerman, 2004: 539). Another form of self-judgment involves causal attribution, which refers to beliefs about the cause of one's mistakes or successes, such as a mark on a computer practice test. According to the Attribution Theory, the motivational dimensions of attributions (see Figure 4) can be classified into three causal dimensions: (a) a locus, (b) a stability and (c) a controllability dimension (Schunk, Pintrich & Meece, 2010). Attributing a low mark to limitations in fixed ability can be very negative towards student motivation, because it implies that efforts to improve on a future test will not be effective. In contrast, attributing a poor computer practice mark to manageable processes, such as the use of the wrong solution strategy, will sustain motivation because it implies that a different strategy may lead to success.

Table 2.1 Achievement attributions classified by the locus, stability, and controllability dimensions (Pintrich & Schunk, 2002:117).

Stability	**Internal**		**External**	
	Controllable	**Uncontrollable**	**Controllable**	**Uncontrollable**
Stable	Long-term effort	Aptitude	Instructor bias/ favouritism	Ease/ difficulty course requirements
Unstable	Skills/ knowledge Temporary or situational effort for exam	Health on day of exam Mood	Help from friends/ teacher	Chance

A student's judgment of his/her learning outcomes may give purpose for him/her to want to explain the way the outcomes are what they are, thus to clarify the causes of the outcomes. The attribution theory thus gives one an insight in a person's perceptions of the causes of his/her learning behaviour or outcomes (Pintrich & Schunk, 2002:93). Pintrich and Schunk

(2002:113) clarifies the importance of the three dimensions of the structure of causal attribution: (a) the locus dimension is about how internal versus external causes are perceived, (b) stability dimension concerns how stable or unstable a cause is perceived, and (c) the controllability dimension concerns how controllable opposed to uncontrollable a cause is perceived.

In relation to the above, self-evaluative judgements are connected to causal attributions about results, such as whether poor performance is due to one's limited capability or a question in a test that is too difficult to answer (Zimmerman, 2000a: 22). Attribution judgements depend on the self-evaluation of aspects such as self-efficacy and environmental variables, and are not mechanical or automatic (Zimmerman, 2000a: 22). Forethought processes also impact attributional judgements (Zimmerman, 2000a: 23).

Self-reaction involves feelings of self-satisfaction and positive affect regarding one's performance. Self-reactions refer to the several reactions such as self-praise, self-criticism, adaptive strategy use, goal adaptation and goal persistence (Schunk et al. 2010: 156; Zito, Adkins, Gavins, Harris & Graham, 2007: 90). Growth in self-satisfaction enhance motivation, whereas decreases in self-satisfaction undermine further efforts to learn (Schunk, 2001).

Self-reactions also take the method of adaptive or defensive reactions, it is the inferences about how a student needs to alter his/her self-regulatory approach during subsequent efforts to learn or perform (Zimmerman, 2000a: 23). Adaptive reactions refer to adjustments designed to increase the effectiveness of student's method of learning, such as leaving or modifying an ineffective learning strategy. This view of self-regulation is cyclical in that self-reflections from prior efforts to learn affect subsequent forethought processes (e.g., self-dissatisfaction will lead to lower levels of self-efficacy and diminished effort during subsequent learning) (Zimmerman and Bandura, 1994). Adaptive effects are important because they direct students to new and possibly better forms of performance self-regulation, such as by setting higher goals for themselves or choosing a more effective strategy (Zimmerman et al., 1992).

Defensive reactions refer to efforts to protect student's self-image by withdrawing or avoiding opportunities to learn and perform, such as dropping a course or being absent for a computer test. In support of this cyclical view of self-regulation, high connections were found among students' use of forethought, performance and self-reflection phase processes (Zimmerman & Kitsantas, 1999). For example, students who set specific proximal goals are more likely to self- observe their performance in these areas, more likely to achieve in the objective area and will display higher levels of self-efficacy than students who do not set goals (Bandura & Schunk, 1981). Other studies have revealed that experts display significantly higher levels of self-regulatory processes during practice efforts than novices (Cleary & Zimmerman, 2000).

Together these self-reactions develop several self-motivational beliefs of students, such as self-efficacy, outcome expectations, learning goal orientation, and intrinsic interest.

Self-regulated students' practical qualities and self-motivating abilities help them to separate them from their peers. Research shows that self-regulated students are more involved in their learning, these students usually base themselves toward the front of the classroom (Labuhn, Zimmerman, & Hasselhorn, 2010), voluntarily offer answers to questions (Elstad & Turmo, 2010), and seek out additional resources when needed to master content (Clarebout, Horz & Schnotz, 2010). Most importantly, self-regulated students also manipulate their learning environments to meet their needs (Kolovelonis, Goudas & Dermitzaki, 2011). For example, researchers have found that self-regulated students are more likely to seek out advice (Clarebout, 2010) and information (De Bruin, 2011) and pursue positive learning climates (Labuhn, 2010), than their peers who display less self-regulation in the classroom. Due to their resourcefulness and commitment, it is not then surprising that findings from recent studies suggest that self-regulated students also perform better on academic tests and measures of student performance and achievement (Schunk & Zimmerman, 2007; Zimmerman, 2008). It looks as though self-regulated learning students can make the difference between academic success and failure (Graham & Harris, 2000; Kistner, Rakoczy, & Otto, 2010).

2.7 Computer literacy within the framework of Self-regulated learning SRL

Academic accomplishment in computer literacy is largely dictated by the SRL capacities of students to coordinate and deal with their learning forms by assuming liability for their own particular picking up, defining objectives and creating reasonable learning systems for their academic accomplishment. Since the students' independence and self-regulated behaviour portray the prerequisites of their condition, it is substantial to accept that self-regulated learning is a basic factor for academic achievement.

The self-regulated procedures and sub-forms depicted in Zimmerman's (2013) display (see figure 2.3) are similar abilities computer literacy requires for academic achievement. Computer literacy necessitates that students be proactive in their examination conclusions, they should know about their qualities and shortcomings by judging their exhibitions, observing their activities, defining their objectives, changing their conclusions and utilizing appropriate investigation systems for particular errands and managing themselves keeping in mind the end goal to ace computer literacy with SRL aptitudes and learning. Students are presented to various impacts in their scholarly profession thusly they should act naturally directed to control their practices, structure their surroundings and plan for reasonable learning methodologies to succeed.

2.8 Conclusion

In this chapter distinctive meanings of computer literacy were communicated about and clarified and how they interface and now and again contrast. Computers additionally extend the scope of vocation choices for students, since all business parts includes computers, for instance human expressions, film, fund, social insurance, news coverage, assembling, music and security.

The purpose for this chapter was to show the review of literature on computer literacy and SRL, the literature directed has given the knowledge of the two ideas. The literature additionally introduced an unmistakable comprehension on the social cognitive theory and the common connection between individual, behaviour and environmental factors and how they impact each other and to what degree they affect the two primary variables. Students needs to get ready for techniques to control the impacts. Qualities of SRL were depicted. Self-regulated students apply distinctive SRL techniques in their studies to make academic progress.

Self-regulated learning is known as an essential indicator of student academic motivation and accomplishment. This procedure involves students to autonomously plan, screen, and evaluate their learning. Self-regulation is essential to the learning procedure (Jarvela & Jarvenoja, 2011; Zimmerman, 2008). It can enable students to make better learning practices and reinforce their study abilities (Wolters, 2011), apply learning techniques to improve academic results (Harris, Friedlander, Sadler, Frizzelle, & Graham, 2005), screen their performance (Harris, 2005), and assess their academic development (De Bruin, Thiede & Camp, 2011). Adding to self-regulation, motivation can fundamentally affect students' academic results (Zimmerman, 2008), without motivation, self-regulated learning is significantly harder to accomplish.

Self-regulated learning has been depicted as the component to which students are metacognitively, motivationally and behaviourally associated with their own learning (Zimmerman, 1990b: 4). Zimmerman goes advance by recognizing three stages in the self-regulation of learning behaviour, these stages are simply forethought, performance and self-reflection stages, which covers six sub-forms including among others task analysis, self-motivation, self-control, self-evaluation and self-reaction.

Maybe our most vital quality as people is our ability to self-regulate (Zimmerman, 2000:13). Self-regulation has furnished us with a versatile edge that empowered our predecessors to survive and even prosper while changing conditions drove different species to annihilation (Zimmerman, 2000:13). Considering one's learning ought not be an idea in retrospect for

students but instead, it ought to be an inevitable period of a cyclic procedure that is gone before by precise forethought and performance control (Zimmerman, 1998, 2000:13, 14).

In the following chapter, the research design and methodology of the study will be discussed in dept.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter focused on the research methodology that was followed to attain the objectives of this study. Several key components of the empirical enquiry (see §3.2) are discussed in this chapter. The research approach provided an outline of the research process and the research design followed (see §3.2.1). The layout of the quantitative instruments (see §3.3.3) and the qualitative instrument (see §3.4.3) used to gather data are explained. The sample procedure, sample size as well as the gathering of data are discussed.

As indicated by Fox and Bayat (2007:5), research is a study or investigation to find realities or pick up data. It is an all-inclusive action that includes contemplating a particular phenomenon unbiasedly to make a satisfactory thought of that phenomenon. In order to understand and address the research questions the researcher used a sequential explanatory mixed-method design (see §3.2.4). The basis behind choosing a sequential explanatory mixed-method design lies in the purpose of this research (see §1.6). The quantitative design (see §3.3) was initially directed and enabled the researcher to research the phenomenon of self-regulation on students' computer literacy in a vocational college and afterward a qualitative design (see §3.4). To help the above, Ponce (2014) states, a researcher should start his study with an exploration approach (stage 1: questionnaire) and uses the findings to outline a second stage (in-depth interviews) (see §1.7). Furthermore, in this chapter the trustworthiness of the interview data is explained (see §3.4.5), as well as the ethical aspects (see §3.5) followed in this study. The summary (see §3.7) of this chapter is provided.

3.2 Mixed-method research

Mixed-methods is a methodology for gathering, analysing and coordinating both quantitative and qualitative information in a research procedure inside a solitary study to gain a superior comprehension of the research problem (Tashakkori & Teddlie 2003; Creswell 2003). At the point when researchers utilized mixed-methods, the quantitative and qualitative information complement each other and permit more compacted investigation. This research design guided the researcher to rising a diagram for the utilization of strategies and precise interpretation of the information obtained from the mixed-method.

3.2.1 Definition of mixed-method research

Creswell and Plano Clarke (2011:5) feel that a definition for mixed-method design should join numerous differing perspectives, which in this part as indicated by the authors depend on a

meaning of core qualities of mixed-method research. The objective of mixed-method design is not to replace either the quantitative or qualitative ways to research, yet rather to draw from the qualities of these methodologies and to limit conceivable shortcomings (Burke Johnson & Onwuegbuzie, 2004:14). As per Brannen (2005: 4), mixed-methods research means embracing a research procedure utilizing in excess of one kind of research strategy. These methods might be a blend of quantitative and qualitative strategies, a blend of just quantitative strategies or a blend of just qualitative strategies. Mixed-method research in its most natural frame is seen to includes parts of both quantitative and qualitative research (Bazeley, 2002: 2; Bergman, 2008: 3; Brannen, 2005: 4; Byrne & Humble, 2006: 1; Fraenkel & Wallen, 2008: 557; Niglas, 2000: 1; Onwuegbuzie & Leech, 2005: 376; Tashakkori & Teddlie, 2008). For the purposes of this study, the following definition was engaged:

> *Mixed-methods research is research that embraces both quantitative and qualitative methods in a single study.*

The rationale for choosing a mixed-methods research design for this research was to:

- Gain information about more an identified phenomenon
- Understand completely and get a full research picture
- Enhance the importance of interpretation
- Allow for surprising advancements
- Generate more profound and more extensive bits of knowledge

Additionally, Scott and Morrison (2007:158) share the belief of advocates of mixed-method research, who argue that:

- A combination of methods enhances triangulation
- A combination facilitates both outsider and insider perspectives and that the research is improved
- A combination may facilitate a better understanding of the relationship between variables and
- A combination allows appropriate emphases at different stages of the research process.

Fraenkel and Wallen (2008: 558) and Creswell and Plano Clark (2007: 10) classify three clarifications for a mixed-method design. Initially, to help explain and clarify the connections between factors, furthermore, to investigate connections between factors and thirdly that a mixed-method design can affirm, or cross-approve connections found between the factors

under investigation (Fraenkel *et al.*, 2008: 558). For the purpose behind this study, the researcher has chosen to utilize a mixed-method methodology that underscores quantitative information and uses qualitative information to substance out the thoughts uncovered in the primary stage. From a pragmatist approached in the mixed-method design, permitted the researcher to give equivalent prominence to the quantitative and qualitative data (Burk Johnson & Onwuegbuzie, 2004: 21).

3.2.2 The pragmatist research paradigm

As per Leedy and Ormrod (2010:2) research is a precise procedure of gathering, breaking down and deciphering data with a specific end goal to build the researcher's conception of the phenomenon of interest. The research paradigm is a huge thought when undertaking a research study. Ang (2014:36) depicts a paradigm as being, “Fundamental models or frames of reference to organise the researcher’s observations and reasoning”.

The researcher sees the research problem (see §1.3) through a pragmatist paradigm, utilizing both quantitative and qualitative research segments inside a mixed-method outline (Creswell & Plano Clark, 2007a: 82; Tashakkori & Teddlie, 2003: 596). Du Plooy-Cillers (2014:19) characterizes a research paradigm as a fundamental arrangement of convictions that aides and coordinates the activity of the researcher. The latter further expresses that the decision of a paradigm is impacted by four primary factors: the issue, the researcher, the procedure and the normal result.

According to Queiroz and Merrell (2006:37), pragmatism in its unique frame can be characterized as a hypothesis of significance or information, which holds that reality estimation of a thought is to be found in its handy application in regular day to day existence. Pragmatists connects the decision of approach straightforwardly to the reason and of the idea of the research questions postured (Creswell, 2003). Supporting the above, Darlington and Scott (2002) take note of that as a rule several choices of whether to take a quantitative or qualitative research approach are construct not with respect to philosophical duty but rather on a conviction of an outline and system being most appropriate to reason.

While pragmatism is viewed as the paradigm that gives the basic philosophical structure to mixed-method strategies (Tashakkori & Teddlie, 2003; Somekl & Lewin, 2005) some mixed-method techniques adjusts themselves logically with the transformative paradigm (Mertens, 2005). The pragmatic paradigm places the research problem as important and applies all ways to deal with understanding the problem (Creswell, 2003:11).

Bergman (2008) states that researchers ought to be constrained in taking an uncertain pragmatist stand to legitimize their decision of mixed-method design or maybe researchers'

decisions ought to be represented by an engaged thinking which characterizes the research processes. As the encompassing of research questions is encouraged by both philosophical and pragmatic issues (Brannen, 2005: 8), the researcher in this study embarked on a mixed-method inquiry for two reasons:

- Pragmatism expresses that the estimation of a thought is to be found in its reasonable application in regular day to day existence and perceives the significance of hypothesis as a method for clarifying and foreseeing phenomena, while subjecting it to the trial of training and time.
- Pragmatism advocates the utilization of a mixed-method design if the research goals regard it is essential.

Pragmatism has been depicted as offering particular thoughts with respect to what constitutes learning (Biesta, 2010).

3.2.3 The mixed-method design

Mixed-method design incorporates collecting, analysing, interpreting quantitative and qualitative information and integrating the findings in a single research study to determine the same primary phenomenon (Tashakkori & Creswell, 2007:4). The power of the integration of quantitative and qualitative methods is directed by assumptions. The researcher incorporated elements of mixed-method design:

- In order to answer the research questions, both the quantitative and qualitative information are collected and analysed.
- The correct procedures (data collection, analysis and integration) were followed in conducting quantitative and qualitative research.
- The use of a theory in the literature (see Chapter 2) to support the procedures.

Mixed-method designs could use concurrent or sequential data collection procedures. In the concurrent design, the quantitative and qualitative information are gathered and analysed at the same time, the priority is equal. However, in the sequential design, quantitative information are gathered and analysed firstly and then followed by the qualitative information (Teddlie & Yu, 2007:77-100).

In this study a sequential design is used. There are four kinds of mixed-method designs: the exploratory design, the explanatory design, the embedded design and the triangulation design (Fraenkel & Wallen, 2008: 560; Creswell, Plano Clark & Garrett ,2008; Byrne,2006: 4).

- **The exploratory design**

Du Plooy-Cilliers (2014:75) describe exploratory design as the primary research done in order to interpret the research problem and recommend suggestions for the problem. The exploratory design first gathers qualitative information to determine the important factors of the research problem and secondly uses the quantitative information. The priority is usually unequal and gives the qualitative design a higher priority, the qualitative design would regulate quantitative design. (Byrne & Humble, 2006).

- **The explanatory design**

The explanatory design uses the quantitative information gathered and analysed, followed by qualitative information to explain the initial research questions (Byrne *et al.*, 2006: 4; Creswell *et al.*, 2008: 69).

- **The embedded design**

The embedded design is a sequential design that was not planned in the proposal phase of the research study. Embedded design is a method that is used after the main purpose of the research study is completed. In some cases, the researcher could realise that the study uses embedded design is deficient and that more information must be gathered to improve the research study. This design gathers qualitative information before the measures begins or after it is complete (Creswell *et al.*, 2008: 69).

- **The triangulation design**

The triangulation design gathers and analyse quantitative and qualitative information at the same time. Priority is equal and given to both forms of information, it could be identified as a one-phase design. The analysed information are then combined into a single understanding of the research problem being investigated (Creswell *et al.*, 2008: 68; Fraenkel *et al.*, 2008: 561).

3.2.4 The sequential explanatory design

The mixed-methods sequential explanatory design comprises of two stages. The quantitative phase occurs firstly and after that the qualitative phase follows (Creswell, 2003). This study was conducted using a sequential explanatory design, where the quantitative statistical analysis stage (see §3.3.4) led and after that the ensuing qualitative stage followed.

The aim for the mixed-methods sequential explanatory design was that the quantitative information and the resulting investigation gave a general comprehension of the research problem. The qualitative information and the analysis enhanced and clarified those factual outcomes by investigating participant's assessments in more detail (Creswell, 2003).

The motivation behind the sequential explanatory design for this study was to:

- seek elaboration, upgrade, description and elucidation of results from the quantitative outline with comes about frame the qualitative plan (additionally called complementarity). Generally, the two research outlines are comparing to produce correlative bits of knowledge that make a greater picture (Brannen, 2005: 12; Niglas, 2000: 4; Sydenstricker-Neto, 1997; Tashakkori *et al*., 2008: 103),
- develop the line of request from the quantitative outline through to the qualitative outline to plot the advancement of the strand of the research as inferences occur out of the quantitative research plan. The reason for advancement is especially important in sequential mixed approached, where one stage takes after the following (Sydenstricker-Neto, 1997; Tashakkori *et al*., 2008: 103) and
- to guarantee that a clear picture of the spectacle is obtained (Tashakkore & Teedlie, 2008: 103).

3.3 Quantitative research

Quantitative research concerns things that can be checked and counted (Du Plooy-Cilliers, 2014:148; Brynard, 2014:39). The quantitative stage of this study used two instruments to gather information from the participants. A 'Self-regulation in computer literacy' questionnaire and a computer literacy test were used and the descriptive statistical analysis of the quantitative data (see §3.3.4) are discussed.

3.3.1 The questionnaire as research method

A questionnaire is a prevalent information gathering instrument among researchers occupied with essential research (Du Plooy-Cilliers, 2014:152). The idea of the data required is controlled by the research objectives of this study and address all the prerequisites recognized in these objectives. Aaker (2011:131) express that the researcher should first decide precisely what data he/she needs to accumulate from participants.

There are a couple of key elements to consider when planning a questionnaire (Bryman & Bell, 2014:204). The elements that were considered by the researcher in this study before she managed the questionnaire are outlined as follows:

- What to inquire? The researcher formulated a clear set of research questions using questioning techniques that allowed the researcher to address each of the respective research questions. The types of questions in the questionnaire were both closed and open ended.

- Layout – the questionnaire ought to be organized in a coherent and clear way.
- Length – there were two factors that the researcher took into consideration to establish the length of the questionnaire: firstly, the researcher has look at questionnaires implemented by previous researchers in her subject area and secondly, conduct a pilot study for testing purposes.
- Coding – coding was used as part of the questionnaire to help process and analyse data. Burns and Bush (2010:352) define coding as the "use of numbers associated with question response options to facilitate data analysis after the questionnaire has been done". This creates a suitable data set for analysis.

The 'Self-regulation in computer literacy' questionnaire used in this study, allowed the researcher to elicit information from the participants and provided the researcher with insight into the meaning and significance of biographical information and self-regulation in computer literacy of participants. The computer literacy test collected information regarding the levels of computer literacy of the participants in this study. Self-regulation in computer literacy is designed by the researcher.

3.3.2 Participants

The researcher used non-probability sampling (convenience and purposive sampling). The participants for the quantitative stage of this study was selected from the Business faculty at a campus of a vocational college in the Western Cape in South Africa. The campus was selected by using convenience sampling and the site was chosen because it is readily available to the researcher. The participants consisted of 120 N4 level students. As indicated by Du Plooy-Cilliers (2014:137) non-probability sampling suggests that the probability of each case being chosen from the aggregate population is not known.

Purposive sampling was utilized, the researcher selected 30 participants per department (Business Management, Marketing Management, Financial Management and Human Resources Management) to participate in the questionnaire and computer literacy test.

As indicated by Wiid and Diggines (2009:199) applying non-probability sampling procedures does not imply that great outcomes can't be acquired, the unwavering quality of the outcomes just can't be affirmed.

3.3.3 Instrumentation

In this study the quantitative data were gathered using two instruments. The researcher designed a 'Self-regulation in computer literacy' questionnaire which also collected the

biographical information of the participants (see Appendix 1). Participants had to answer the 'Self-regulation in computer literacy' questions on an answer sheet (see Appendix 2). The researcher developed a computer literacy test (see Appendix 3) in order to test the computer literacy skills of the participants. All the questions used in the instruments were close-ended questions. This questionnaire was designed based on the literature of computer literacy and the self-regulation learning skills of Zimmerman(2000a). Self-satisfaction involves the views of satisfaction or dissatisfaction and associated affect regarding one's performance (Zimmerman, 2000a: 23). Highly self-regulated students value their intrinsic feelings of self-respect and self-satisfaction from a task well done more highly than acquiring material rewards (Bandura, 1997).

3.3.3.1 'Self-regulation in computer literacy' questionnaire

The questionnaire was developed based on the research questions (see §1.5) and the purpose of this study (see §1.6) to gather information from the participants. The sections in the questionnaire were designed to get biographical information and self-regulation in computer literacy data from the participants. To ensure a rational flow in the questionnaire, the researcher grouped the questions according to self-regulation skills. The questionnaire was completed by the participants anonymously in a classroom. The questionnaire was adapted on Zimmerman's (2000) model, to measure the students' level of self-regulation in computer literacy (see Appendix 1) with relation to goal setting, strategic planning, self-evaluation and self-reaction

3.3.3.1.1 Outline of the 'Self-regulation in computer literacy' questionnaire

The questions (1-4) of section A of the questionnaire were aimed to gather biographical information such as the gender, age, race and home language of the participants.

The researcher formed sub sections to split the questions in this self-regulation in computer literacy questionnaire.

- **Goal setting**

  Questions in this section were designed to determine if participants could set and achieve computer literacy goals (see Table 4.2).

- **Strategic planning**

  The questions in this section were aimed to acquire whether participants plan accordingly to achieve computer literacy (see Table 4.3).

- **Self-recording**

Questions in this section were aimed to regulate if participants applied self-recording skills to their own performance and their responses to computer literacy tasks (see Table 4.4).

- **Self-evaluation**

  This section contains questions aimed at evaluating whether the participants were able to evaluate and reflect on themselves after a computer literate assignment or assessment (see Table 4.5).

- **Self-reaction**

  Self-reflection questions in the last section were aimed to determine whether participants knew if they made a mistake and the techniques needed to fix the mistakes (see Table 4.6).

3.3.3.1.2 Scale used with the 'Self-regulation in computer literacy' questionnaire

The researcher used a Likert scale (i.e. as a ranking scale) as an assessment tool to acquire the responses in this questionnaire. A five-point rating scale was used in this questionnaire, aimed to measure the participants' responses to the statements. Participants had to rate themselves according to how well the statement describes them personally. The rankings of the participants were *not at all like me, not very much like me, fairly much like me, much like me or very much like me* to the statements (see Table 3.1).

Table 3. 1: Likert scale for the self-regulation in computer literacy questionnaire

Key				
1	**2**	**3**	**4**	**5**
Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me

3.3.3.1.3 Validity of the self-regulation in computer literacy questionnaire

Validity confirm the extent to which a measurement measures what it should measure. The content validity of this study alludes to the degree to which the questionnaire covers the total substance of the specific concepts that it is set to gauge. The face validity is valid when an expert researcher in the subject field, reviewing the instrument and declares whether the measuring instrument covers the concepts what it should cover. The self-regulation in computer literacy questionnaire is grounded in the research questions of this study and also based in the sub-sections: goal setting, strategic planning, self-recording, self-evaluation and

self-reaction. Construct validity pertains to the level to which a data collection instrument was able to measure the constructs of what it claims to measure (Brown, 1996:231).

The questionnaire was created to measure self-regulation and computer literacy skills, the questions in the questionnaire secured the distinctive perspectives. Construct validity of the overview alludes to the degree to which the questionnaire was estimated to the qualities that was observed yet should rather be alluded from designs in a person's behaviour (e.g. inspiration, innovativeness – are constructs), confirm has been contracted to quantify the construct being examined (Maree & Pietersen, 2007:146).

3.3.3.1.4 Reliability of the self-regulation in computer literacy questionnaire

Blumberg (2011:500) portray reliability as a characteristic of measurement concerned with exactness, precision and consistency. It is the degree to which the questionnaire was utilized as a part of this study, created reliable and true outcomes. Wilson (2014:129) and additionally Babbie (2010:150), portray reliability as the degree to which an estimation of a wonder gives steady and reliable outcomes. Reliability is joined with validity in this study to be reliable, it should be valid.

3.3.3.2 The computer literacy test

The computer literacy test (see Appendix 3) was used as an assessment tool, consisting of 35 questions in total, 25 multiple choice questions and 8 true of false questions. The questions in this test were based on general knowledge of a personal computer, computer skills and computer literacy. This test was designed by the researcher to measure the participants' level of computer literacy skills and knowledge.

3.3.3.2.1 Rationale and purpose

The computer literacy test was given to the entire population to determine the general personal computer knowledge, computer skills and the computer literacy level of the participants in order to answer the sub research question 1 (see §1.5). These responses from the participants allowed the researcher to determine whether participants are high computer literates or low computer literates.

3.3.3.2.2 The computer literacy test procedure

The following test procedure was followed in this study:

- The entire population (n = 120) was tested in a classroom at a particular vocational college in the Western Cape, but not at the same date and time. Four groups were

created, 30 participants per group and 4 days were used to test all the groups, 1 group per day. The classroom could only accommodate 30 participants at a time. One hour were used per group per day.

- Each participant was seated at a single desk; participants were only allowed to have a pen with them.
- Each participant was issued a computer literacy test.
- The test was explained to the participants.
- The computer literacy test was completed by each participant.

3.3.4 Statistical analysis of quantitative data

The statistical analysis of the data in the quantitative design in this study used descriptive statistical procedures in order to organise, analyse and interpret the data according to the sections in the 'Self-regulation in computer literacy' questionnaire and the computer literacy test. Dimensions were noted as answers to the Likert scale and converted into percentages to acquire scores for the purpose of the quantitative clarification by using the frequency distribution table. The means and standard deviations of the objects were calculated.

The statistical analysis of data requires related activities, such as the foundation of classes, the utilization of these classifications to basic data through coding, arrangement and after that illustrate measurable clarifications. As per Kothari (2006:18), the data ought to be condensed into tables for further analysis. For the computer literacy test, the responses were marked by the researcher using a memorandum. A percentage was worked out for each participant, all the percentages of the participants were loaded on a labelled excel spreadsheet.

3.4 Qualitative research

In relation to the quantitative stage of this pragmatic sequential mixed method research study, the qualitative stage was conducted to give meaning to topics and concepts uncovered in the quantitative section of this study.

Qualitative research as depicted by Widd and Diggines (2009:86) includes the gathering, investigation and clarification of data that can't be numerically explored. As indicated by Du Plooy-Cilliers (2014:173), qualitative research includes looking at attributes, characteristics, occasions, individuals and matters related with them that can't without much of a stretch be decreased to numerical qualities. As noted by Brynard (2014:39) qualitative structures enable the researcher to know individuals on a personal level, to contemplate them as they are and

to encounter their genuine circumstances. This approach allowed the researcher to interpret and portray the activities of the participants. Morgan (2014:47) notes that qualitative research is for the most part less organized than quantitative research and because of the detailed data gathered, utilizes smaller sample sizes.

Bryman and Bell (2014:215) go on to say that the adaptability of qualitative interview makes this an exceptionally appealing data gathering technique.

3.4.1 Interview

With-in a sequential explanatory mixed-method technique (see §3.2.4), the qualitative data is utilized to clarify and expand on a phenomenon uncovered by the quantitative data of this study. The data in the qualitative stage of this study was gathered by utilizing semi-structured face to face interviews. Interviews are more generally connected with a qualitative research technique (Wilson, 2014:153). As indicated by Wilson (2014:153) and Ang (2014:147), there are a few positive circumstances related with interviews, including the following:

- The capacity to take part in verbal and non-verbal correspondence.
- The respondent's criticism can be recorded (if allowed), which suggests precision.
- There is more noteworthy adaptability when making inquiries.
- The completion is quick and direct.

Morgan (2014:54) trusts that interviews are moderately unstructured, questions grow precipitously, and the interviewer can investigate for in-depth replies by empowering and motivating the participants to take interest.

3.4.2 Participants

By utilizing interlaced sampling (Flick, 2007:112), 10 % (n=12) of the quantitative population, those with high computer literacy (5%) and those with low computer literacy (5%), were identified from the computer literacy test scores to be interviewed. The purpose for identifying the 10% of the quantitative populace derives from the sequential explanatory mixed-method design in the quantitative stage of this study. It is specified in the sequential explanatory mixed-method design that the qualitative stage in this study was intentionally designed to support the findings of the quantitative stage in this study. The research number indicate class group A-D and student 1-30, example A4 is a student in class group A and fourth on the class list. The interlaced sampling is indicated in Table 3.2 below.

Table 3. 2: High and low computer literacy test scores

Research number	Scores	High	Low
A1	20%		✓
A21	77%	✓	
A28	26%		✓
A30	23%		✓
B14	17%		✓
B24	74%	✓	
B25	80%	✓	
C12	29%		✓
C28	69%	✓	
D2	74%	✓	
D3	80%	✓	
D24	23%		✓

The reason for the use of convenience sampling is that it was easy for the researcher to contact the participants for this study. This is the least rigorous technique, involving the selection of the most accessible subjects. It is the least costly to the researcher, in terms of time, effort and money. According to Sauders, Lewis and Thornhill (2012) convenience sampling is a simplicity sampling and the data gathered can be encouraged in brief length of time, the latter, indicate that convenience sampling is the cheapest to execute. On the other hand, there are also difficulties of convenience sampling to be aware of. Setting up the interview questions and completing the interview can be risky because numerous interviews require specialised skills. The participants can't generally be ensured anonymity and therefore participants might not be willing to answer questions due to touchy or private data.

A purposive sample is a non-probability sample that was chosen considering attributes of the population and the purpose of this study. The researcher interviewed the participants regarding their perspectives and feelings about their perspectives of computer literacy and self-regulation of self-regulation. The clarification of convenience and purposive sampling in this study is that participants are convenient because they are known by the researcher and seen every day at the campus. Most sampling strategies are purposive in nature since researchers often approach the sampling issue because of a plan in mind.

3.4.3 Instrumentation

The researcher designed semi-structured interview questions. In order to collect data for the qualitative stage of this study, the researcher developed an interview schedule to guide the researcher during the interview process. As per Morgan (2014:109), the primary goal of interviews is to take in more about the participants' points of view on the research questions.

The researcher made use of an interview document during the interview process to make personal notes and key points during the interview and all the interviews were recorded on a recorder.

3.4.3.1 Interview schedule

The researcher directed the interview utilizing a semi-structured interview schedule, indicating prearranged questions. The semi-structured questions permitted the researcher to determine the specific request and wording of questions ahead of time yet in addition enabled the researcher (interviewer) to review and cross-check questions during the interview (Fraenkel & Wallen, 2008: 447). The researcher utilized semi-structured piece of the interview to build up a similar schedule utilized by Zimmerman & Martinez-Pons (1986: 614; 1988: 285).

Zimmerman and Martinez-Pons (1986: 615) documented six diverse learning frameworks (i.e. in the classroom, at home, while finishing composing assignments outside of the class, while finishing arithmetic assignments outside of the class, while getting ready for and stepping through exams, and when defectively motivated) where participants requested to show the strategies that they use to take part in class, to study and to finish their assignments. With a specific end goal to make every setting as significant as conceivable to the participants, Zimmerman and Maritinez-Pons (1986: 615) gave existing cases of every point of view. The qualitative stage of this study aimed to simplify the data gathered from the quantitative stage.

The researcher adapted Zimmerman and Martinez-Pons (1986: 615) six diverse learning scenarios and modified it in order for it to be connected to the self-regulatory concepts used in the interview schedule. The interview schedule aimed to resolve how the prearranged self-regulatory concepts of goal setting, strategic planning, self-recording, self-reflection and self-reaction are utilized when connecting it with computer literacy skills in the classroom. The researcher was only interested in the processes mentioned above of Zimmerman's (2000) model.

By adapting Zimmerman and Martinez-Pons (1986: 615) research, the researcher practiced the self-regulatory learning concepts and sorted the interview questions applicable to the concepts in categories (see Table 3.3).

Table 3. 3: The concepts and interview questions grouped

Goal setting	Explain how you decide on your goals?
	How do you organize your goals?
	How do you plan to achieve your goals?
	Why is achieving your goal important to you?
	How will you benefit from reaching your goal?

	What challenging goals do you set for yourself?
	Who will support you to achieve your goal?
Strategic planning	Why is time management important for you?
	What strategies do you use if you do an assignment?
	How do you check if you have reached your goal?
	How would you handle interruptions while you are busy with your assignment?
	What are some good time management skills
	Tell me about the most useful technique you have for managing your time?
Self-recording	What type of questions do you ask yourself to make sure you know your work?
	What do you do if you don't understand your work?
	How would you know how good or bad you have done after a test?
	How do you motivate yourself
	If you work in a group and you are the leader, how would you make sure that the rest of the group members do their part and that the group submit on time?
Self-reflection	How do you evaluate yourself to determine what you know and don't know?
	What do you do to make sure that the work you hand in is correct?
	When doing an assignment, what do you do to make sure you understand what is expected from you?
	What do you do when you don't know and understand certain concepts or functions?
	What do you do if your results for a test or assignment was very low?
	How would you improve poor results?
Self-reaction	If you didn't meet a deadline for an assignment, how would you manage your time for the next due date?

	How do you evaluate what you learned?
	How would you change the way you study to accommodate the content?

3.4.3.2 Interview procedure

The interviews were held in a classroom at the specific campus. The data collected from the semi-structured interviews were recorded using audio recording equipment. Participants were interviewed at a scheduled date and time that was suitable for both the researcher (interviewer) and participants (interviewee), the researcher kept in mind not to interfere with the participant's academic timetable. The interview process took place after college, in order not to disrupt their preparations for the examinations of the participants. The interview was between 25 and 35 minutes in length.

Each participant was treated with thoughtfulness, with the initial task of the researcher was to establish a friendly, secure, cooperative environment during the interview process. The statement of the research problem and the purpose the interview process in this study were clearly explained to the participant before the interview process started. Participants were assured of the confidentiality of their participation in the interview process.

As indicated by Fraenkel and Wallen (2008: 449-450), there are certain etiquettes of practices that exist for all interviews: respect humanities, respect the participants, be normal, build up a suitable compatibility with the participants, ask a similar question in various ways during the interview, request that the participant repeat an answer when there is some uncertainty about the fulfilment of a comment, change the communication flow of the process as the interviewer and abstain from driving questions. The researcher applied these practices consistently throughout the interview process. Therefore, the researcher constructed a relaxed and pleasant atmosphere during the interview process, and refrain from controlling the progression.

3.4.4 Thematic analysis of interview data

Riessman (1993) developed four models for qualitative analysis tools, namely, Thematic analysis, Structural analysis, Inter-actional analysis and Performative analysis. Thematic analysis was used by the researcher for this qualitative data (semi-structured interviews) to be analysed. The researcher used the transcription of the interviews to transform the data from the recorded interviews in order to derive information from the participants to grasp a greater perceptive of the self-regulatory concepts and computer literacy skills in the interview schedule of this study. Maree (2016:115) states that reading and re-reading the transcripts

gives the researcher a thorough understanding of the data gathered and by doing that it is a good analysis. The data gathered in this stage were analysed through the process of coding and categorization. The participant's answers were recorded and captured in the transcription of this study. The codes used relate to the self-regulatory concepts and the computer literacy skills. The categories used were based on the interview questions grouped under the themes that were identified for the codes used in this study, the researcher incorporated three types of coding processes identified by Strauss & Corbin (1990):

- **Open coding**

In this coding process, the researcher read and re-read the data gathered to understand the data better (Flick, 2009). During this process the researcher identified the concepts in the qualitative analysis, to examine and categorize the data.

- **Axial coding**

The researcher used axial coding after the open coding to make connections between the codes (concepts) in this study and connect it with the categories (interview questions) in this study.

- **Selective coding**

In this coding process, the researcher used the core category - interview questions grouped under to the self-regulatory concepts and identified the relation to the other categories – interview questions grouped under computer literacy.

3.4.5 Trustworthiness of interview analyses

The importance in this qualitative research is the validity of interview questions. There are a wide range of methods for building up validity, including part check, interviewer substantiation, comparability and adjust among others. For the qualitative data the researcher utilized the trustworthiness to measure validity and reliability within the appropriate answers of the semi-structured interviews.

The researcher additionally referred to the credibility to guarantee precision of the data that the researcher deciphered during and after the interview process. Lincoln (2009) communicates about the significance of keeping up validity and reliability inside the qualitative research by expressing that it has been an exemption as opposed to the decide that a qualitative research report incorporates a conversation of unwavering quality.

Reliability is dependent upon validity. A researcher must determinedly record the criteria on which category decisions are to be taken (Dey, 1993:100). The ability of a researcher is to use

the interview data analysis framework flexible to remain open to alterations, to avoid overlaps and to consider previously unavailable or unobservable categories, is largely dependent on the researcher's familiarity and understanding of the data.

Bogdan and Biklen (2007) and McMillan and Schumacher (2010:393) point to methodologies that ensure validity in this study:

- Lengthy data collection period: In this study the researcher provided the necessary opportunities for all the participants to contribute during the interview session.
- Field research and observation: The researcher conducted the research in a natural setting to promote the reality of everyday life experiences of the participants more accurately than a contrived setting would.
- Participant review: In this study the participants were asked to review the transcribed interviews to check the accuracy of presentation.
- Position of the researcher: The position of a researcher was clarified and declared the biases relating to the data collection and analysis.

3.5 Ethical aspects

Ethics is characterized by Resnik (2010) as standards that recognize worthy and admirable conduct. Ethical standards are stipulated by Fraenkel and Wallen (2010, 57) were connected all through this research study. These standards include proficient ability, proficient associations with members, security and reliability.

The following ethical aspects was addressed in this research study (see a:

- The researcher sent a formal letter to the Department of Higher Education to ask for permission to conduct this research.
- Once permission was granted by the Campus Manager of the particular vocational college in the Western Cape, the process started (Appendix 10).
- Letters of consent were sent out to the managers and Head of Department of the campus in order to receive the appropriate permission for testing some of the students.
- Informed consent stressed that all participants (students) had the choice whether to participate or not and these letters of consent were signed by the participants
- The confidentiality of each participant was guaranteed and respected. Each participant was given a research number to ensure confidentiality.

Participants were assured that they would not be harmed while participating in this research. Care was taken that no harm, risks, discomfort and frustration were experienced by the participants during the research study. Maree (2016:44) stresses that before research starts, the researcher must be receive the authorization first. The researcher adhered to the above.

Nkwi, Nyamongo and Ryan (2001) exhort that at whatever point we lead research on individuals, the prosperity of research participants must be our top priority. The research question is of optional significance. This implies if a decision must be made between doing damage to a participant and doing harm to the research, the research is sacrificed.

An Ethics number (EFEC1-5/2017) was granted, by the Faculty of Education at the Cape Peninsula University of Technology (CPUT), to the researcher. This Ethics number was granted in accordance with the criteria set out by the CPUT Ethics Committee.

3.6 Administrative Procedures

Approval was granted by the Faculty of Education Ethics Committee of the Cape Peninsula University of Technology (CPUT), Department of Higher Education (DHET) as well as from the campus manager, academic manager, head of department and program manager at the TVET college where the study took place. The TVET manager was informed were informed by a formal letter via email about the research study.

3.7 Conclusion

This section has made clear the procedures and motivations behind the mixed-method investigation outline which is rooted in the paradigm of pragmatism and the theoretical framework on social cognitive theory. This chapter has likewise depicted the research procedure as indicated by the accompanying subjects: purpose, research paradigm of pragmatism, theoretical framework of social cognitive theory, a mixed-method research design, quantitative research, qualitative research, ethical aspects and administrative Procedures.

Chapter 3 also provided information regarding the population, sampling, data generation methods as well as data analysis methods. Considerations relating to validity, reliability and trustworthiness, and ethical aspects were also discussed.

CHAPTER FOUR: ANALYSIS AND INTERPRETATION OF DATA

4.1 Introduction

In Chapter 2 the perceptions of computer literacy (see §2.4) and self-regulated learning (see §2.5) were presented. Participants with self-regulated learning skills could be confident enough to do well in computer literacy. Chapter 3 presented the research methodology used in this study which included the: sequential explanatory mixed-method design (see §3.2.4), the quantitative stage was firstly conducted, and the qualitative stage followed.

In this chapter, the data were analysed to determine what self-regulatory skills participants need to be computer literate, also how participants interpret computer literacy skills and how the use of self-regulatory strategies differ between participants with high computer literacy and those with low computer literacy. The data were analysed in two phases, firstly, the quantitative analyses discovered the self-regulation in computer literacy using a questionnaire and a computer literacy test to determine participants with high computer literacy and those with low computer literacy. Secondly the qualitative analyses, followed sequentially to clarify the above interactions, by using semi-structured interviews. The data from the quantitative and qualitative analysis were merged (see §4.5) for a better understanding of the nature of self-regulation in computer literacy.

4.2 Quantitative analysis

The quantitative analysis in this section discusses the recorded responses from the biographical information, self-regulation in computer literacy and the computer literacy test scores. The sections below give an explanation of the quantitative data analysis in this study.

4.2.1 Biographical information

This section of the analyses is directed at analysing the data regarding the biographical information of the participants to provide a structure that allowed the researcher to describe the population of a particular campus of a vocational college in Cape Town (see table 4.1).

Table 4. 1: Biographical information of participants

Section A: Biographical information (Question 1-9)	**F**	**%**
1. Gender		
Male	37	31
Female	83	69

2. Age		
17	1	1%
18	16	13%
19	18	15%
20	20	17%
21	18	15%
22	8	7%
23	13	11%
24	4	3%
25	3	3%
26	5	4%
27	5	4%
29	2	2%
30	1	1%
32	2	2%
33	1	1%
34	1	1%
42	1	1%
Missing	1	1%
3. Race		
Black	62	52%
Coloured	55	46%
Indian	1	1%
White	2	2%
4. Home Language		
English	23	19%
Afrikaans	35	29%
Xhosa	60	50%
Other	2	2%

The participants in this study involved 120 N4 level students at a particular campus of a vocational college in Cape Town. The participants were part of four different departments on the particular campus. The researcher selected 30 students from each department (Business Management, Marketing Management, Financial Management and the Human Resource Department) on the campus to participate in this study.

All the students who participated in the study had Computer Practice N4 as a subject. The level N4 is the first academic level students start with after matric at a FET college, after N4 they would receive a certificate and move to N5 then N6. After N6 they graduate with a National Certificate. A discussion of the biographical information of the participants follows.

- **Gender**

The majority of the participants in this study were females on 69 % and the males were the minority with 31%.

- **Age**

The ages of all the participants ranges between 17 and 42 years old. There was only one student of the following ages; 17, 30, 33, 34 and 42-year-old and two were 29 and 32 years old, three were 25 years, four were 24 years, five were 26 and 27 year olds. The average ages were eight 22 years, thirteen 23 years and sixteen 18 year olds. The majority of the population (17%) were 20 years old and the rest were 18 and 21 years old both 15%. One participant did not indicate the age on the survey.

- **Race**

Most of the participants of this study were black with 52%, followed by the coloureds on 46%. The whites were on 2% and the Indians on 1%, they were the minority.

- **Language**

The isiXhosa home language was 50% which made up most of the participants, while Afrikaans was on 29% and English on 19%. The other languages only had 2%.

- **Summary**

The majority of the participants in this study were black (52%) and coloured (46%) with 69% of the population being female and 50% being isiXhosa home language speakers. The participants ranged in age from 17-42 years of age, with the majority of the participants (60%) falling into the age bracket 18-20 year olds.

4.2.2 Computer literacy test scores

The aim of the computer literacy test was to determine the level of computer literacy of the participants (see §3.3.3.2.1). The computer literacy test was out of 35 marks and were marked by the researcher using a memorandum (see Appendix 4). The mark was translated to a percentage. The percentage of each participant was recorded on an excel spreadsheet. The average of the computer literacy tests results were 52% out of the 100%. Therefore, the researcher could derive from the results that participants are not fully computer literate, 48% of the computer literacy test scores were clear that the participants did not have previous experience with a personal computer. The percentage indicated their level of computer literacy per group (see Appendix 6-9).

4.2.3 'Self-regulation in computer literacy' questionnaire

The data of the questionnaire (see §3.3.3.1.1) to reflect the frequency of the responses of the participants as well as to discuss the means and standard deviation of each question within the sub-sections.

The mean of a five –point Likert scale was interpreted according to 5 groupings to facilitate an analysis of low and high computer literacy. The procedure was applied for the analysis and interpretation of:

- Goal setting (§2.6.2.1)
- Strategic planning (§2.6.2.1)
- Self-recording (§2.6.2.2)
- Self-evaluation (§2.6.2.3)
- Self-reaction (§2.6.2.3)

4.2.3.1 Goal setting

The purpose of the sub-section of the questionnaire of self-regulation in computer literacy was to determine if participants could set and achieve goals. The data are presented in Table 4.2.

Table 4. 2: Goal setting

Statements			Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me	Mean	SD
2.	I complete my Computer Practice assignments before the cut-off dates	f		2	45	52	19	3.75	0.74
		%		1.70	37.50	43.30	15.80		
7.	When set a goal I can't reach, I usually break it up in more attainable goals and work at them one at a time until I reach my initial goal	f		6	42	40	32	3.82	0.89
		%		5	35	33.30	26.70		
12.	I set specific goals for each section of my work	f	2	11	45	32	30	3.64	1.01
		%	1.70	9.20	37.50	26.70	25		
16.		f	1	4	32	50	33	3.92	0.87

	I start early to prepare for a test	%	0.80	3.30	26.70	41.70	27.50		
18.	I try to work at a constant tempo	f	1	5	43	38	33	3.81	0.92
		%	0.80	4.20	35.80	31.70	27.50		
24.	I prefer to set short term goals	f	2	7	41	37	33	3.77	0.98
		%	1.70	5.80	34.20	30.80	27.50		
33.	Before doing an assignment or start preparing for a test/exam, I set a goal which I plan to attain with the assignment or test/exam	f		7	45	52	16	3.64	0.79
		%		5.80	37.50	43.30	13.30		

According table 4.2 it can be concluded that 80.80% of the participants agreed that it is fairly much like them or much like them to complete their computer practice assignments before the cut-off dates, while 1.70% said it is not very much like them. The majority of the responses to statements 7 (68.30%) and 12 (64.20%) also agreed that they break up goals in more attainable goals if they can't reach the goal. Responses to statement 16 revealed that 69.20% of the participants start early to prepare for a test, their indicated mean of 3.92 which was the highest value score for this section. Statement 18, concerning to work at a constant tempo, specifies that 67.50% agreed that it was fairly much like them or much like them respectively, with a mean of 3.81. It is concluded that statement 33 with the highest percentage of 80.80% participants set goals before doing a test/exam. This question had the lowest mean of 3.64 together with statement 12.

The data set for self-regulation in computer literacy showed that participants in this study have a time management plan in place to achieve their goals, especially according to the Zimmerman's three phase cyclical model of self-regulated learning. The forethought phase consists of task analysis and self-motivation beliefs. The goal setting falls under the task analysis together with strategic planning. According to the information gathered in table 4.2 there is a strong link between goal settings and strategic planning, for participants to achieve their goals they need to plan consequently. From the information gathered in table 4.2, the researcher obtained that the computer literacy of participants has an influence when they set their goals. According to question 16 in the questionnaire, participants had to indicate if they start early to prepare for a test, if a participant doesn't have a computer or has poor computer literacy skills it is difficult for the participant to practice on their own and with no self-regulated skills it is even more difficult for them.

According to the information of goal settings in table 4.2, the researcher can derive that participants have good time management skills, because most of the participants agreed that they complete their assignments as well as tasks before the cut-off dates.

4.2.3.2 Strategic Planning

The purpose of the sub-section of this questionnaire was to acquire information regarding participants if they can plan accordingly to achieve their goals at the end. Statements in this section specifically dealt with planning, statements were designed and directed in order to determine whether participants can plan accordingly. The data collected for the sub-section of strategic planning are presented in Table 4.3 below.

Table 4. 3: Strategic Planning

Statements			Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me	Mean	SD
8.	Before doing an assignment, I first read as much on the topic as I can	f		9	33	54	24	3.78	0.86
		%		7.50	27.50	45	20		
10.	When I have to do an assignment, I work out how much time it will take to complete the assignment	f	1	6	46	46	21	3.67	0.85
		%	0.80	5	38.30	38.30	17.50		
14.	I first work out a framework before writing the answer to an essay-type question	f	4	9	33	41	33	3.75	1.05
		%	3.30	7.50	27.50	34.20	27.50		
19.	Before I begin studying, I think about things I will need to do to learn	f	1	6	31	56	26	3.83	0.85
		%	0.80	5	25.80	46.70	21.70		
20.	When doing an assignment, I make certain that I know how to follow the recommended guidelines stated in the study guide	f		5	31	45	39	3.98	0.87
		%		4.20	25.80	37.50	32.50		
22.	When I prepare for a test, I make sure that I know precisely on what the test will be and what type of questions will be asked	f	2	5	49	46	16	3.58	0.84
		%	1.70	4.20	40.80	38.30	13.30		
23.	Before I study new course material thoroughly, I often skim it to see how it is organised	f		2	46	41	30	3.83	0.83
		%		1.70	38.30	34.20	25		
27.		f	1	9	33	47	29	3.79	0.93

	Before doing an assignment, I speak to others who know more about the topic than I do	%	0.80	7.50	27.50	39.20	24.20		
35.	When reading for this course, I make up questions to help focus my reading	f		4	47	45	24	3.74	0.82
		%		3.30	39.20	37.50	20		

An analysis of Table 4.3 exposes that the majority of the responses (92.50%) to the statements indicated that they plan accordingly, before a test, assignment, assessment or exam. The other statements regarding strategic planning revealed that:

- 76.60% of the participants indicated that they work out the time needed to complete a certain assignment. The mean of this question was calculated at 3.67, indicating an average value of this sub-section related to strategic planning.
- 89.20% of the participants indicated that they first work out a framework before writing an essay, their responses vary from much like me to very much like me, only 3.30% indicated that they do not work out a framework before the time and that it is not at all like them.
- 46.70% selected that it is much like them to think about things they need to study before the test, while 25.80% said it is much like them. The mean of this question was 3.83, second highest of all the means in this section.
- 95.80% of the responses to the statement 20 was that participants follow the recommended guidelines stated in the study guide when they do an assignment, this question had the highest mean on 3.98.
- 79.10% of the participants indicated that they make sure that they know what to study for a test. For this question the mean was 3.58, which was the lowest for this section.
- Most of the participants' responses to statement 27 was much like them on a percentage of 39.20% the rest of the participants selected that it is fairly like them (27.50%) to speak to someone who knows more about the subject.

The mean of statement 22 was the lowest on 3.58 and second lowest was statement 10 on 3.67. The responses to statements 8, 10, 20, 27 and 35 had the highest percentages ranges between 90% - 98%. The average percentages were between 64% - 78% for statement 19, 22 and 23, the participants indicated that the statement fairly relates to them. The researcher found that if participants have computer literacy skills and knowledge, they can plan

accordingly easier, because they will be able to use these skills and knowledge when they plan and practice these skills at the same time. According to table 4.3, most of the participants indicated that they read as much as they can before they do an assignment, if participants don't have computer literacy skills and knowledge it is difficult for them to read before the time, because they don't understand the computer related terms and functions. The researcher can derive from her personal experience that the participants would not be able to plan effectively if they don't know the basics of computer literacy.

The researcher came to conclusion that the strategic planning section also forms part of the forethought phase (task analysis). According to the information in table 4.3, time management also played an important role in the strategic planning, where participants selected an action plan and choose the correct strategies that are needed to achieve their goals. The evidence provided in table 4.3 showed that the majority of participants indicated that they plan accordingly before a test, assignment or examination. This can increase academic success by participants who set specific goals for themselves. This process also helps to develop a positive mind set.

4.2.3.3 Self-recording

Self-recording refers to a method by which the participants record the frequency of their own performance of a specified behaviour, responding to instructions. The sub-section of the questionnaire dealt with questions related or involving self-recording such as: does participants follow up; do they make notes or check if they attain their objectives. The results of this sub-section appear in Table 4.4 below.

Table 4. 4: Self-recording

Statements			Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me	Mean	SD
4.	When I study, I make notes regarding important aspects of the work I'm studying	f		6	39	44	31	3.83	0.87
		%		5	32.50	36.70	25.80		
25.	After completing an assignment, I check my work to make certain it is correct	f		4	38	45	33	3.89	0.85
		%		3.30	31.70	37.50	27.50		
28.	When I'm reading course work, I stop once in a while and go over what I have read	f		7	34	57	22	3.78	0.81
		%		5.80	28.30	47.50	18.30		
29.		f		4	35	51	30	3.89	0.82

	When I study, I keep a record of the words or facts I can't remember or understand	%		3.30	29.20	42.50	25		
30.	When studying, I keep track of the time it takes me to read or learn a specific number of pages or a chapter	f	2	5	37	45	30	3.81	0.92
		%	1.70	4.20	30.80	37.50	25		
34.	During contact sessions, I make notes of important aspects of the work we discuss	f		7	46	47	19	3.66	0.82
		%		5.80	38.30	39.20	15.80		
36.	I usually check if I have attained all the objectives or outcomes	f	1	3	49	39	28	3.75	0.87
		%	0.80	2.50	40.80	32.5	23.3		

An analysis of the above table indicated that 40.80% of the participants which is the highest of all, selected that they usually check if they achieved their objectives. On statement 4, 95% of the responses was between fairly like me, much like me or very much like me, which means they make notes of important aspects regarding the work they study. The results of the responses to statement 25 (97.70%) was more or less like the responses of statement 4.

Statement 4, 25 and 29 had the highest mean of 3.83 and 3.89, which indicates that a high value associated with the fact that the participants does keep record of facts they don't understand and that they double check their work to make sure it is correct.

- 68.30% of the responses to statement 30 indicated that they keep track of the time when they read or learn a specific chapter.
- 15.80% of the participants indicated that they make notes of the important aspects. This statement had the lowest mean of 3.66.

In this sub-section, only statement 30 and 36 had responses to not at all like me, with very low percentages of 1.70% and 0.80%.

In this section the researcher links the self-recording to the performance phase of Zimmerman's (2002:67) cyclical phases of self-regulation. The performance phase consists of self-control and self-observation (self-recording) it involves processes during learning and the dynamic attempt to apply specific strategies to help participants become more successful. According to the information of table 4.4, most of the participants indicated that they usually check if they achieved their goals, most of them also agreed that they make notes of important aspects.

By interpreting the information of table 4.4 participants' self-record their time used, to make them aware of how much time they spend studying and when completing an assignment, they check their work and make sure it is correct. It is also clear in this sub-section that self-recording is a record of perceptions being monitored by the participant itself in order to achieve the goal.

4.2.3.4 Self-evaluation

To become lifelong novices, participants need to learn the importance of self-evaluation. When participants evaluate themselves, they are assessing what they know, do not know and what they would like to know. Participants with computer literacy skills and knowledge will find it easy to evaluate themselves on computer practice or related subjects, because they could rate and test themselves on a personal level for them to achieve their end goal. They begin to recognize their own strengths and weaknesses. In this sub-section of the questionnaire the self-evaluation is presented in table 4.5 below.

Table 4. 5: Self-evaluation

Statements			Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me	Mean	SD
1.	After having prepared for an exam, I have a good idea of what marks I can expect for the exam	f	1	16	38	41	24	3.59	0.98
		%	0.80	13.30	31.70	34.20	20		
5.	I check over my work to make sure I did it right	f		1	38	48	33	3.94	0.79
		%		0.80	31.70	40	27.50		
11.	When I have to do an assignment, I make sure that I know what is expected of me	f		6	33	53	27	3.85	0.83
		%		5	27.50	44.20	22.50		
15.	When I have written a test, I usually have a good idea of how well I have done, before the test has been marked	f		12	34	39	35	3.81	0.97
		%		10	28.30	32.50	29.20		
17.	I ask myself questions to make sure I understand the material I have been studying	f	1	6	32	49	32	3.88	0.89
		%	0.80	5	26.70	40.80	26.70		
21.		f	5	20	42	30	22	3.37	1.10

	While studying, I ask myself questions regarding the work I have learnt to check if I understand the work	%	4.20	16.70	35	25	18.30		
26.	While studying, I try to determine the concepts I don't understand well	f		2	34	51	32	3.95	0.79
		%		1.70	28.30	42.50	26.70		
31.	I often find that I have been studying for some time but don't know what it is all about	f	1	7	38	51	23	3.73	0.87
		%	0.80	5.80	31.70	42.50	19.20		

An analysis of this sub-section revealed that the participants (85.90%) in this study indicated that they have a good idea of what marks they can expect for an exam that they did.

- 40% of the responses to statement 5 was that participants check their work to make sure it is right. This question had the highest mean of 3.94, which is also an indication that most of the participants check their work.
- 44.20% of the participants indicated that they make sure they know what is expected of them when they need to do an assignment.
- 61.70% of the responses to statement 15, was much like me and very much like me, the rest of the responses was 28.30% fairly like me and 10% not very much like me.
- The majority of the participants (35%) responded to statement 21 that it is fairly like them to ask themselves questions regarding the work to make sure that they understand the work. The mean for this question was 3.37, the lowest for this section.
- 70.80% of the participants responded to statement 26 that they try to determine concepts that they don't understand. This question had the highest mean of 3.95, which is an indication that the majority of the participants agreed to this statement.
- 19.20% of the responses to statement 31 was that participants feel that it is much like them to study for some time and then realise that they don't know what it is all about. This question had a mean of 3.73.

This sub-section of self-evaluation involves reflection after the performance (self-recording), a self-evaluation of outcomes compared to the goals the participants set for themselves. This sub-section can be linked to phase 3 the self-reflection. The majority of the participants

indicated that they have a good idea of what marks to expect after exams. At this point participants could also ask themselves did they accomplish what they planned to do.

According to the information of table 4.5, self-evaluation could be linked to self-monitored information with a goal, because participants agreed that they check over their work to make sure it is right before they hand in and they also agreed strongly that when they study they ask themselves questions regarding the work to make sure they understand the work. The researcher derives from this sub-section that self-evaluation allows participants to judge how well they complete an assignment or exam by comparing their performance with their academic standards.

4.2.3.5 Self-reaction

The purpose of this sub-section of the questionnaire was to attain data regarding participants if they understand or know if they made a mistake or failed for them to improve and change their plan if it didn't work. If participants have computer literacy skills and knowledge, they would be able to identify their mistakes and correct it on their own. The data collected for the sub-section of self-reaction are presented in Table 4.6 below.

Table 4. 6: Self-reaction

Statements			Not at all like me	Not very much like me	Fairly much like me	Much like me	Very much like me	Mean	SD
3.	When I become confused about something I am reading or studying for this course, I go back and try to figure it out	f			38	58	24	3.88	0.71
		%			31.70	48.30	20		
6.	When I realise that I haven't set enough time to complete a task or assignment, I reschedule my time	f	1	9	36	50	24	3.73	0.90
		%	0.8	7.50	30	41.70	20		
9.	When I realise that I don't understand the material I am reading or studying, I change the way I read or study	f		2	40	48	30	3.88	0.80
		%		1.70	33.30	40	25		
13.	If I realise that I can't solve a problem, I ask someone for help	f	5		43	37	35	3.85	0.90
		%	4.20		35.80	30.80	29.20		
32.		f	2	8	37	54	18	3.66	0.88

	I try to change the way I study to fit the course requirements and the lecturer's teaching style	%	1.70	6.70	30.80	45	15		

An analysis of Table 4.6 reveals that the majority of the participants (68.30%) indicated that if they don't understand what they study or read that they go back and try to figure it out. This question has the highest mean of 3.88.

Statement 6 had a percentage of 71.70%, where participants stated that it is fairly like them and much like them to reschedule when they realise that they don't have enough time to complete an assignment.

95.80% of the participants responded that they ask someone it they can't solve a problem or don't understand. The mean to statement 13 was 3.85.

The majority of the participants (90.80%) in this study indicated that they try to change the way that they study to fit the requirements of the course. Statement 32 had the lowest mean of 3.66.

It can therefore be concluded that self-reaction and self-evaluation has a strong linkage. Self-reaction in this sub-section had adaptive reactions, according to the information in table 4.6 the adjustments that participants made, increased their effectiveness of one's method of learning, such as changing an ineffective learning strategy. Participants indicated that they reschedule if they see that they don't have enough time to complete an assignment. Practically 60% of the participants indicated that they ask for assistance if they cannot solve a problem and that is also an indication of change behaviour for them to achieve their goals.

4.3 Qualitative analysis

Participants were interviewed regarding their understanding of computer literacy and their use of self-regulatory skills in order to answer the research sub-question 1 and 2 (see §1.5) in this study.

4.3.1 Computer literacy

The researcher utilized interlaced sampling by selecting, 10% of the quantitative population, those with high computer literacy (5%) and those with low computer literacy (5%), from the computer literacy test scores to be interviewed (see §3.4.2) in order for the researcher to determine their computer literacy skills.

Computer literacy is defined as the knowledge and ability to use computers and related technology efficiently with a range of skills covering levels from elementary use to programming and advanced problem solving (Ikolo, 2011). Computer literacy is the capacity to use a computer and related technology proficiently. Computer literacy includes the feeling that one has when working on a computer, it can be a feeling of confidence, fear, anxiety or satisfaction.

4.3.1.1 Computer literacy defined

Responses made by participants with high computer literacy, indicated that computer literacy is all about knowing the computer and the different programs. Responses were as follows with regards to what it entails:

- *Being able to work with the computer*
- *Working on a computer*
- *To have basic computer skills*
- *To know how to use a computer*
- *Knowing the programs on the computer*
- *To understand the computer*
- *Working on the computer and know the different programs*
- *Basic knowledge of the computer, people who have the background of the computer*
- *To know how to work on the computer and the programs on it*
- *The offices that is on the computer*

Participants with low computer literacy stated that computer literacy entails the following:

- *Things to do on the computer*
- *Word, excel, access*
- *Use the computer*
- *What you can do on the computer*
- *To work on a computer*
- *To work on a computer*

- *Computer literacy is the basics*
- *Being able to use a computer and its functions*

The responses to the question, *what elements makes up computer literacy,* high computer literate participants answered:

- *To be able to type*
- *Word, excel, access and PowerPoint*
- *Technology*
- *Components on the computer and programs*

Low computer literacy participants' responses to the above question were the following:

- *Keyboard, mouse, boxes*
- *Word, excel, access and PowerPoint*
- *I don't know*

From the information gathered above it is clear to the researcher that participants (both high and low computer literate) could not defined computer literacy properly. Some of the participants could not answer the questions because they are not computer literate. According to their answers, the researcher could derive that participants had no idea that feelings forms part of computer literacy (see §2.4).

4.3.1.2 Differences between terms related to computer literacy

The participants who revealed higher levels of computer literacy within the context of this task indicated according their knowledge the difference between computer literacy and digital literacy as follows:

- *I don't know*
- *Computer literacy is the programs on the computer and digital literacy is to make the programs*

All the participants with low computer literacy indicated that they *don't know* the difference between computer literacy and digital literacy.

The majority of the high computer literate participants were not able to explain the difference between ICT literacy and computer literacy, they responded:

- *I don't know*
- *ICT is how to create programs*
- *ICT is creating programs*

Participants with low computer literacy responded that they also *don't know* the difference between ICT literacy and computer literacy, there were only one who responded as follows:

- *Computer literacy is the basics of the computer and ICT is more in detail*

It was clear for the researcher, that the participants did not have enough computer knowledge to define the different terms. Most of the participants were incompetent to explain the differences. Since they could not explain the different terms, thus it has an impact on their academic learning, especially computer related subjects. They would also find it difficult to interpret questions, because they don't understand the terms.

4.3.1.3 Emotions when using a computer

Most of the participants, whether they were high computer literate or low computer literate, indicated that they feel nervous when they work on a computer. Examples of these statements for high computer literate responses included:

- *Nervous, but it does get better*
- *Scared and nervous*
- *I feel at ease in front of a computer*
- *I feel at ease because I know how to work on it*

The low computer literate participants indicated the following feelings when they work on a computer:

- *I feel nervous*
- *I feel nervous because it is my first time*
- *Clueless*
- *Confident*
- *Sometimes I'm scared, but most of the time I'm okay*

Some of the high and low computer literate participants indicated that they are nervous when the computer practice lecturer asks them questions related to the computer in the class. The high computer literate participants reacted as follows:

- *I get nervous*
- *Scared, because maybe the lecturer think it is a stupid answer*
- *Relaxed when I know the answer and nervous when I don't know*

The low computer literate participants responded as follows to the above question:

- *Scared*
- *Scared, because I don't trust myself, because it is my first time*
- *Nervous*
- *Scared because I don't know if my answer will be right*

How do you feel when you need to use a computer to do an assessment for marks? High computer literate participants responded as follows to this question asked during the interview:

- *Relaxed, because I know what to do*
- *If I know the assessment, I feel okay*
- *Scared*
- *I feel nervous because I don't know how to do it*

Most of the low computer literate participants felt nervous and scared, their responses were as follows:

- *Nervous and scared*
- *I feel like I'm going to get poor marks because I'm not sure and feel afraid*
- *I feel good because I know I will be able to do it*

Participants were asked how they feel if they need to do an assessment at home and how they feel when they need to do an assessment in class. High computer literate participants reflected the following responses when they do assessment at home:

- *I feel at ease because I know what to do*

- *I have a never mind feeling*
- *Not a good feeling, because you don't know if you are on the right track, feeling unsure*
- *At home there is no pressure, feeling relaxed*
- *At home I get stuck and frustrated*

High computer literate participants felt as follows when they do an assessment in class:

- *I feel at ease because I know what to do*
- *I feel okay because I know I have to get it done*
- *Feeling okay, because there is someone to ask*
- *I'm nervous*
- *Feel better in class because I can ask someone*

Low computer literate participants indicated that they feel comfortable, lost and unsure when they do an assessment at home:

- *At home I'm not sure, because the is no one to ask*
- *At home I feel comfortable, because there is no lecturer, no one can look at me I can do it by myself*
- *No rush feeling comfortable*
- *At home I struggle, because the computer at home and the computer in class is different*
- *At home I feel a bit lost*

In class, low computer literate participants felt as follows:

- *I class I feel more freely, because there are people that I can ask*
- *In class I feel like I will do it wrong because I don't trust myself, I feel nervous*
- *Everything is fast, and I feel pushed*
- *More relaxed, because there is a lecturer and other students that can help me*
- *Relaxed, because the lecturer is there to help me*

Most of the high computer literate participants indicated that they would not ask the lecturer questions in the class related to certain things that is not clear, they are too nervous. These participants stated:

- *Nervous, but I must ask and answer*
- *I would not ask the lecturer I rather ask a fellow student, because I'm scared*
- *I will not ask, because I'm too shy and will think it is a stupid question*
- *I will ask, because it can benefit others in the class, they might be nervous to ask*
- *I will ask, it is for my own benefit*

On the other hand, participants with low computer literacy responded as follows:

- *I will not ask in front of everybody, I will go to the lecturer because since I know nothing about computers, I feel nervous and embarrassed to ask questions*
- *I will not ask, because I feel like I'm going to ask an obvious question that everyone knows*
- *I will not ask, because I don't know how to explain to the lecturer, I will know how to ask a friend but not a lecturer*
- *Not really, because it might be a stupid question, I will rather call the lecturer to the side*
- *I will ask if I don't understand*

The majority of the participants with high computer literacy indicated that they think you need to be computer literate in order to complete the task, they responded as follows:

- *Yes, if you don't have computer skills you won't do it right*
- *Yes, at the beginning I was not able to do it on my own, but with the help of my lecturer I will be able to do it*
- *Yes, because you won't know how to do the task*
- *Yes and no, it would be easier if you know what to do, but some people can learn by telling them how to do it*

One of the participants said no, because there is a lecturer that will tell you what to do.

The low computer literate participants indicated the following:

- *Not really, because when I started, I didn't have an idea how the computer works but with the help of my lecturer I was able to do it*
- *No, because you just need to learn the basics of computer*
- *Yes, because it would be easier if you know what you do*
- *Yes, if you do not you can't do this task*
- *Yes, if you not use to the computer you won't be able to do it*

The high computer literacy participants believed that one needs to be computer literate to complete this task successfully. A few participants with low computer literacy indicated that it is not necessary to be computer literate to complete this task successfully, because the lecture is there to help.

The above section with regards to the views and opinions of participants about computer literacy, as well as the feelings they experience when working on a computer, is not what the researcher expected. Both high and low computer literate participants were not able to provide a proper definition about what computer literacy is. The responses from the high computer literate participants was that computer literacy is about the understanding of the computer while the low computer literate participants stated that it is the things to do on the computer.

The researcher could conclude that the feelings participants' experiences when they work with a computer, is one of the main factors that contributes to the lack of computer literacy skills. Participants are overwhelmed with different feelings due to their lack of computer literacy and they are too afraid to ask for help. The use of self-regulatory strategies could help participants to improve on their confidence in order to progress computer literacy skills (see §2.5). Therefore, the self-regulated learning gaining from a social cognitive judgement would be significant for participants to create subject information, higher order thinking abilities and basic reasoning abilities to set goals for themselves for a constantly changing world (Zimmerman, 2002:64).

4.3.2 Challenges encountered by the participants in becoming computer literate

The participants with the high computer literacy score, were not able to define certain computer literate term properly, what the researcher derive from the proses is that the high computer literate participant is good in doing the practical part but when it comes to the terminology they are totally lost (see §4.3.1.1). The participants with the low computer literate scores were very nervous and scared to participate in the interview, some was crying before the time, some of the participants were so nervous that they couldn't answer some of the

questions. In some cases, it took the researcher some time to calm the participant. The main challenges are the following:

- Participants are very nervous.
- Participants cannot read and don't understand the instructions.
- Participants don't have computers to practice.
- Participants are not confident enough to ask questions if they don't understand certain concepts.
- Participants fear the lecturer.
- Participants struggle to understand when lectures speak in English.
- Due to personal circumstances participants miss out on work and that leads to confusion.

In the qualitative stage, the self-regulatory strategies that were analysed were: goal setting, strategic planning, self-recording, self-evaluation and self-reaction. These strategies are discussed here (see §4.3.3.1). The quotes are highlighted in *italics* if it is directly quoted from the interviews.

4.3.3 Goal setting

The responses from the participants who took part in the interviews, regarding the goal setting in computer literacy were analysed to determine if the different goal setting strategies differ between participants with high computer literacy and those with low computer literacy. Also to determine if the goal setting strategies has an influence to improve on their computer literacy skills.

4.3.3.1 Setting a goal

The following responses made by participants with high computer literacy, indicated that it is important for them to reach the goal at the end of the task. Most of the responses were to get good marks as indicated by the statement below:

- *To pass the task and get good marks*
- *To get everything right and to complete the task in a minimum time*

When setting goals, participants with low computer literacy were concerned about the understanding of the task and the computer itself, their responses were as follows:

- *To make sure that I understand the practical task and meet my requirements of this task*
- *To understand how to do the task and be able to do it on my own without assistance*
- *To understand and know what to do on the computer*
- *To understand and be accurate in computer literacy*
- *To be able to do everything*

The responses to the question, *how will you organize the different questions in this task,* to achieve the goal at the end of the task. Participants answered:

The high computer literacy participants' responses to the above question were that they also write it down first, while the others responded as follows:

- *Do the easy once first than the difficult ones*
- *Start with first question and do it in order*
- *First read through the questions and see what I can do*

Low computer literacy participants' responses were the following:

- *To write the questions down, read and follow the instructions*
- *Start at the beginning*
- *Open folders to know where to go*

It was important for the high computer literate participants to achieve their goal at the end in order for them to get high marks and be able to complete everything in time, on the other hand for the low computer literate participants, their goals were to have a better understanding of the task and be able to do it on their own.

4.3.3.2 Planning to achieve a goal and task strategies

The participants who revealed higher levels of computer literacy within the context of this task inclined to read questions thoroughly to make sure they understand the instructions in order to achieve their goals. Their responses were:

- *Read my questions correctly*
- *Write everything down and compile everything according to the order and see what I can do*

- *See if I did everything and do my utmost best to see if I can get a mark for it*
- *If I don't know what to do, I will ask my lecturer or a fellow student that knows what to do for help*
- *Working in a constant pace*

The majority of the participants with low computer literacy tended that they would practice on a regular basis to achieve their goal at the end of the task.

- *To have a time frame for every task*
- *I don't know*

The reason as to why it is important to reach the goal at the end of the practical task, participants with high computer literacy responses were:

- *To pass my computer practice and go to the next level*
- *To get my marks what I want*
- *In case I don't do my assessments in class this task will boost my marks*
- *To become a better person in life and organizations is looking for computer literate people*
- *Because I want to achieve my goal*

Participants with low computer literacy responded that it is important for them to reach their goal at the end of the task in order for them to be competent one day and be able to work on a computer. Also, that they know how to work on a computer:

- *To benefit myself*
- *It is important because it is part of my career, so I need to pass this*
- *To have more insight on computer literacy*

Planning to achieve the goal at the end, participants with high computer literacy focussed more on the understand of the instructions by reading it over and over and make sure that everything is correct in order for them to get high marks. The participants with low computer literacy focussed more on practicing and have a time frame in place to achieve their goals.

4.3.3.3 Reaching a goal

Most of the participants, whether they were high computer literate or low computer literate, indicated that they would benefit by gaining more experience in the workplace one day and that employers are looking for computer literate employees. According to the researcher the participants interpreted the question incorrectly and their answers were based on long term goals. Examples of these statements for high computer literate responses included:

- *Take on problems in the real world, when I'm working*
- *I will get more experience*

Some of the high computer literate participants were not sure how it would benefit them to reach their goal at the end of the task as responded:

- *I don't know*

High performers seem to have more positive outcome expectations than low achievers.

The low computer literate participants indicated the following to the above question about how reaching their goals would benefit them:

- *Employers look for people who is computer literate*
- *Gaining experience in the workplace one day*
- *Go to work in an office*
- *If I pass, I will go to the next level, I will get good marks*
- *I would know how to do it*

Participants were asked how they would stay focussed when doing the practical task to make sure they reach their goal at the end of the task, some of the high computer literate participants responded that they would focus on what they are doing and stay out of any distractions. The other high computer literate participants indicated that they would stay focus by doing the following:

- *To read questions*
- *Get a quiet place to do my work*

A few of the low computer literate participants indicated that they would stay focused by focussing on the practical task. Examples of the participants' responses were:

- *Focus to stay focussed*
- *To focus*
- *By listening to the instructions and doing the work afterwards*
- *I will make sure that I plan everything*
- *Practice and do something new everyday*

According to the above section of reaching a goal, participants did not clearly understand the question, most of them whether it was high computer literacy or low computer literacy participants, they didn't answer the question based on the task but long term and how it would benefit them after their studies. The researcher think that they interpreted the question differently as to how it would be a benefit for them long term. Some of the participants were not clear and answered that they don't know. The outcome expectations were low because they did not understand the question.

Participants with high computer literacy and those with low computer literacy indicated that they choose to set specific goals so that they can reach their main goal at the end of the practical task. This indicates that most of the participants, whether they have high computer literacy or low computer literacy, can set goals. What is interesting though, is that some of the participants were not clear on how to organise their questions in order to reach the goal. The majority of participants (both high computer literate and low computer literate) had a plan in place, which indicates they have the ability to set goals in order to complete the task.

4.3.4 Strategic planning

Participants need methods in place that are appropriate and related to the task as well as the setting of it (Zimmerman, 1989). Strategic planning provides participants with valuable self-efficacy knowledge and skills. Participants could use strategic planning to improve their academic goals. The responses made by participants about strategic planning were divided into two sub-sections: Time management and planning strategies.

4.3.4.1 Time management

All the participants whether high or low computer literate stated that time management is important for them. Statements related to why time management is important for high computer literate participants includes the following:

- *Yes, because if you don't do your task in a certain time you won't finish, and you will lose marks*

- *Yes, because time is money*
- *Yes, because there is a restricted time limit to finish the task*
- *Sometimes yes*

Participants with low computer literacy responded as follows:

- *Yes, it is so that I can do everything in time*
- *Yes, to know what to do at what time or how long especially for exams*
- *Yes, it is limited*

Participants were asked how they would manage their time to make sure that they meet the deadline of the task, the high computer literate participants responded as follows:

- *Make myself a timetable*
- *To first answer the questions, I know and then the ones I'm not sure of*
- *I will take an hour to do one thing and afterwards the other*
- *Use a few minutes for each question*
- *A day or two before the task must go in, I will ask a lecturer to show me how to do the ones that I don't understand*

The responses from the low computer literate participants answered:

- *To have a timetable*
- *Make sure I do my work before the deadline*
- *First do those that I know and then those that I know less*
- *I will do it piece by piece*
- *To do something every day to make sure it is on time*

In relation to the task, participants were asking how much time they would use to complete the task, most of the participants (both high and low computer literate) stated that they would need 1 hour to complete the task. Responses from the high computer literate participants were:

- *30 minutes*
- *1 Hour*

- *1 Hour and 30 minutes*
- *Two weeks*

A participant with low computer literacy indicated that she needs *10 minutes* to complete the task. The rest of the responses of the participants with low computer literacy were as follows:

- *Half an hour to an hour*
- *1 Hour*
- *1-2 Hours*
- *2 Hours*

Participants were asked during the interview, what they think are good time management skills to have when they are doing a practical task on the computer, some of the participants (high and low computer literate participants) indicated *I don't know.* The other responses from the high computer literate participants indicated the following:

- *Make a stop path and make sure I cover all the different sections*
- *Take 20-30 minutes to read through, if I don't understand ask someone*
- *To focus only on it*

The low computer literate participants answered the question as follows:

- *To start early*
- *To time myself*
- *To make sure that you are fast and start early*

According to the responses from the above section about time management, both high and low computer literate participants believe that it is important to manage time effectively in order for them to achieve their goals at the end of the practical task. The researcher derived from the responses provided that the average time needed to complete the task was 1 hour and 30 minutes according to both high and low computer literate participants. Some of the participants were not sure of what time management skills are.

4.3.4.2 Planning strategies

When high computer literate participants were asked to indicate what strategies, they would use to do the task, most of them referred to the notes and steps that they usually follow when

doing exercises in class. Participants had attention focusing, attention focusing is also part of SRL skills in the performance phase of Zimmerman's model. A few of them said *I don't know,* the others responded as follows:

- *If we did steps in class, I will read through it*
- *Open and sign in and go to raw data and follow the instructions given*
- *I will download the work and do the task*

The low computer literate participants indicated the following:

- *To make notes*
- *Open up the computer and write notes down*
- *To keep on practicing*
- *To have a schedule so I know what to do when*

Participants had to answer this question; *how would you handle any interruptions while you are busy with this task?* Both high and low computer literate participants indicated that they need to stay focussed and they will ignore interruptions. High computer literate participants' state:

- *I will ask the lecturer to talk to the students that interrupt me, at home I will ask my family to keep the noise down.*
- *I will ignore everyone*
- *I will tell them to stop I am busy*
- *I will answer them and go back to my work*
- *I will try to stay in a quiet place with no interruptions*

Participants with low computer literacy responses were:

- *I will ask them not to bother me*
- *I will make sure that I put my focus on my work*
- *I won't bother me with people and stay focussed*
- *I will tell them that I am busy with important stuff and that they should ask somebody else*

Participants' responses to interruptions while they are busy with the task, were positive, high computer literate participants stated that they would assist fellow mates if they need assistance and immediately go back to the task, they also preferred to get a quiet place to do the task in order to avoid interruptions. Participants with low computer literacy indicated that they would only focus on the task and not entertain interruptions. The low computer literate participants are very focussed and serious about the task more than the participants with high computer literacy, because they offered to entertain interruptions.

Participants with high computer literacy and those with low computer literacy indicated that time management is important. From the interview analysis the researcher could derived that participants know that it is important to have time management skills in order to submit on time. Some of the high computer literacy participants were unclear about certain questions and could not answer it (I don't know). Most of the participants indicated that they need 1 hour and 30 minutes to complete the task. Some of the responses were not very clear and related to the question, but the participants kept their goal in mind and during the process of completing the task they knew that they must have a plan in place to work according.

With regards to the above question about planning strategies, there is a strong link between the high and low computer literate participants to this question, most of their answers were the same for example: make notes, open and sign in then follow instructions. Their responses linked to each other based on the steps and notes they would follow to complete the task. None of the participants referred to any self-regulated learning strategies that would help them, the researcher believed, the reason for that is that they are not familiar with the self-regulatory strategies and they don't know that these self-regulatory strategies would help them to achieve their goal. The researcher feels that the educators should incorporate these strategies.

4.3.5 Self-recording

Participants who find computer literacy interesting and want to increase their knowledge and skills, tend to be more motivated. These types of participants would record their performance and also compare their performance with fellow participants to achieve higher levels of success and effectiveness.

4.3.5.1 Keeping records and monitoring of instructions not understood

The participants that were interviewed, stated that they would keep track of the instructions that they don't understand in the task and ask the lecturer. Responses of high computer literate participants included:

- *Ask the lecturer, if I'm at home I will wait till the next morning and ask someone that knows*
- *Read questions twice and if I don't understand I will ask*
- *I will ask the lecturer, at home I will google*
- *I will do research or ask someone*
- *Check notes and ask lecturer*

While participants with low computer literacy indicated that they do keep track of instructions in the task that they do not understand with responses like:

- *I read it twice, check the textbook, ask the lecturer or read on the internet*
- *Write down the instructions that I don't understand and ask the lecturer*
- *Ask the lecturer or read the questions until I understand*
- *Continue reading and If I don't understand I will ask the lecturer to explain to me*

Participants were asked how they would check if their tasks are properly completed and correct. Participants indicated that they checked the task to make sure of what must be done correctly. Records regarding checking the task for high computer literate participants included:

- *Ask the lecturer to come and see my work, If I'm at home I will save my work on a USB and ask the lecturer the next day*
- *When I'm done with the task, I will first check the task before I print it*
- *To re-read the task and have a checklist*
- *I will ask someone to double check my work*
- *Read through my questions and see if I completed everything*

Participants with low computer literacy also indicated that they would keep track of what they need to do in order to complete the task properly and correctly, responses included:

- *To check with my classmates if my work is the same as theirs*
- *After I'm done with my task, I will go through it again and check if there are any mistakes and correct it*
- *I will check in the textbook*

- *I will compare it with the textbook or checklist*

Both high and low computer literate participants indicated that they keep track of the instructions that they don't understand. The high computer literate participants stated that they would first try to figure it out on their own and read it over and over and they would also check their notes made in class to get a better understanding, if they still don't understand after trying on their own they would ask the lecture. On the other side the low computer literate participants didn't indicate that they would first try to figure it out on their own, the majority of them indicated that they would ask the lecturer if they don't understand.

4.3.5.2 Motivation

Most of the participants with high computer literacy, indicated that they motivate themselves with a positive attitude to make a success of the task. They stated:

- *To tell myself I can do it*
- *I am somebody that really pushes myself*
- *By staying positive and ask if I don't understand*
- *I will tell myself that I have to do things right*

While one of the high computer literacy responses was, *I'm not sure how to motivate myself to make a success of this task.*

Responses from the low computer literate participants were:

- *To focus on the task*
- *I will make sure that I put in all my effort to make sure that my practical is successful*
- *I will just tell myself that I can do it*
- *Spend a lot of time on it so I know what I'm doing*
- *I will keep on trying until I get it*

Participants were asked during the interview to indicate how they would act as a leader if this was a group task and how would they make sure that each group member participate in order for the group to submit on time. The responses from the high computer literacy participants reflected the following:

- *I will divide the questions to each member, have a due date, if member doesn't participate, I will help or motivate the member to finish*

- *As a group we will set up a time to meet and get information about the task, if someone doesn't participate, I will report the member to the lecturer and try to replace the member*
- *Get everybody together, easy stuff for members that struggles and tough parts for members that knows what to do, if they don't do their parts I will tell the lecturer and kick them out of my team*

A few indicated that they *don't know* what to do in such a case as a leader.

The low computer literate participants answered the question as follows:

- *I will check up on them and if they don't do it, I will do it for them*
- *I will make sure that they complete their work and every time we meet, they must bring something, if someone doesn't do their part or don't know how to do it I will assist the person*
- *I will tell everyone in the group to do something, they will know that we all will get bad marks if they don't do their parts*
- *Give them a time limit, explain what to do, if they don't participate, I will tell them the importance of the task*
- *We must start the task early so that we have enough time left if there is a mistake to correct it. If one of the members don't do their part, I will first talk to them and if they don't listen, I will go to the lecturer*

All the participants indicated that they would motivate themselves with positive attitudes and thoughts. The high computer literacy participants focussed on themselves for motivation, the participants with low computer literacy focussed on doing the task in order to motivate them to make a success of the task.

Both participants with high and low computer literacy indicated that they keep track of instructions that they don't understand and ask the lecturer for assistance. The difference between the above is that the participants with high computer literacy would read more, do research and try to figure it out on their own before they ask the lecturer, on the other hand the participants with low computer literacy will totally depend on the lecturer if they don't understand the question, even if they are at home, they will wait till the next day. Thus, is a clear indication that they don't trust themselves with the computer.

With regards to the motivation of participants, high computer literate participants, believe in themselves and have a positive attitude towards the task, while the low computer literate participants strive to do their best and would try to achieve their goal, what's interesting about this statement is that the high computer literate participants have more confidence in themselves than the low computer literate participants to make a success of the task. Based on Zimmerman's model (2000), self-efficacy and motivation are strongly connected, when students believe that their actions can produce the outcomes they desire, they are also motivated to act when facing difficulties.

There was a strong link between the responses of the high computer literate and low computer literate participants. Both participants indicated that they would give each member in the group a section to do, if they don't do it, they would assist as the leader and if they still don't participate, they would involve the lecturer. Most of the high computer literate participants indicated that they need to be computer literate to complete the task, only one out of the high computer literacy group indicated that it is not necessary to be computer literate because the lecture is there to help. The low computer literate participants had a mixture of yes and no. According to the above responses from the participants, it is a clear indication that participants with high computer literacy can easily achieve their goal if they follow the correct steps, they are more motivated and confidently try tasks on their own on the other side the low computer literate participants are very careful before they do something on the computer and fully depend on the lecturer or someone to assist or check their work, basically not confident enough to work independently on the computer.

4.3.6 Self-evaluation

When they evaluate their attainment of the learning goals, it would be a valuable learning tool as part of their learning process. When they evaluate themselves, they would be able to identify their own skills, fill the learning gaps and see where their current knowledge is weak and improve on it. For participants to become lifelong learners it is important for them to learn the importance of self-evaluation. During the process of self-evaluation, participants begin to recognize their own strengths. Self-evaluation responses were analysed by determining whether participants could analyse what they could and could not do in the task and how they would improve.

4.3.6.1 Self-evaluation after task

With regards to how participants would evaluate themselves after the task, to determine what they could do and not, the majority of the high computer literate participants indicated that they will check their answers in the textbook. Their responses were as follows:

- *By checking again, the questions and in the textbook*
- *Look at the questions and check the textbook*
- *I will do my task and ask someone to check my work*
- *I will highlight the stuff I don't know and try to do it afterwards*
- *I don't know*

While participants with low computer literacy indicated that they would focus on what they could do, with responses like:

- *By writing down or highlighting the questions that I could do and then ask the lecture help with the ones I could not do*
- *To see where I struggle and focus on that*
- *To see where my strong and weak points is and work harder on the weak points*
- *I will finish my task and then check it with the textbook if it is right*
- *I will go through my results and see what is right and wrong and correct the ones that was wrong*

High computer literate participants stated that they would evaluate themselves afterwards by checking the answers of the questions in their textbook. Low computer literate participants indicated that they would focus on the things they know in the task and highlight the questions that they don't understand and ask the lecturer or check in the textbook. Once again it is clear that the participants with low computer literacy don't try to do things on their own or try figuring it out if it is unclear to them, they depend on others.

4.3.6.2 Understand the terms

The high computer literate participants who were interviewed indicated that they would ask the lecturer or someone else if they don't understand certain terms or instructions. Their responses included:

- *I will ask someone or google it*
- *Ask my lecturer or google it*
- *I will check in my textbook*
- *Use a dictionary or ask someone to explain it*

Most of the responses from the low computer literate participants were that they would ask their lecturer or check in the textbook, their answers to the question were:

- *Ask the lecturer*
- *Check the textbook*
- *Do research on the internet*
- *Go through my notes*

Most of the participants, both high and low computer literate, indicated that they would ask the lecturer if they don't understand certain terms or instructions and check in their textbook.

4.3.6.3 Self-improvement

If your results for this task is very poor and not what you expected, how would you improve it? The responses form the high computer literate participants were:

- *To work harder and practice more*
- *By working extra hard*
- *I will check in the textbook where I went wrong*
- *I will ask the lecturer for help or ask the lecturer to help in me in private*
- *I will ask the lecturer for the assignment to check where I went wrong so for the next time if there is a similar question, I will know how to do it*

The low computer literate participants indicated the following:

- *By practicing*
- *Spend more time on it*
- *I will change my strategy of practices*
- *To spend more time on the next task, ask lecturer for help, textbook or internet for help*

Both the participants with high and low computer literacy indicated that they would work harder by practicing more for them to improve to get better results.

Most of the participants (high and low computer literate) that were interviewed indicated that they would check their textbook to evaluate themselves to determine what they could and could not do. Some of the low computer literate participants strictly focussed on the sections that they could do, to improve on that for the next task.

Majority of the participants that were interviewed reflected that they would ask their lecturer or someone to help them if terms or instructions is unclear. Both high and low computer literate participants indicated that they would do research (google) if they don't understand certain terms. One of the low computer literate participants stated that she would use her notes to check if it can help her to understand the terms or instructions.

With regards to the self-improvement section, participants with high computer literacy tended to practice more and work harder, while the low computer literate participants indicated that they would ask the lecturer for help and guidance. During self-evaluation it is once again an indication that it is all about getting high marks for the high computer literate participants, while the low computer literate participants focus on doing the task right, figure out their mistakes in order for them to improve for the next task, it is important for the low computer literate participants to understand the instructions in the task then to get high marks.

4.3.7 Self-reaction

Self-reaction allows participants to re-evaluate their own knowledge and skills. During this process participants could punish or reward themselves if they succeeded or not.

4.3.7.1 Assistance

The following responses made by participants with high computer literacy, indicated that they would try to search on the computer if they don't know how to figure out certain settings or how to create something on the computer and if they don't get it right they will check their textbooks or ask for help:

- *I will ask the lecturer*
- *There is a thing on the computer, a help thing that I will type it out*
- *I will do research or ask someone*
- *Check in my notebook or textbook, also play around on the computer, check the settings and see if I can do it on my own*

Participants with low computer literacy also indicated that they would check their textbooks and ask the lecturer, with responses like:

- *Check textbook or ask lecturer*
- *I will check my notes, if not in notes I will ask for help*

- *I will play around on the computer until I get it*

Participants were asked for who they would ask for help if they cannot do the task on their own, participants with high and low computer literacy indicated as follows:

- *The lecturer or students that knows*
- *My classmates or lecturer*
- *Someone at home because they know how to use a computer, a friend or lecturer*
- *My brother*
- *I will check in my textbook and after that if I still don't understand ask the lecturer*

The high computer literate participants stipulated that they would first try to figure out what they need to do on their own, before they ask for assistance from the lecturer or classmates. Participants with low computer literacy indicated that they would also try on their own by checking their textbook or notes, and after that ask the lecturer for help. Most of the participants indicated that they would ask the lecturer if they don't know how to do the task on their own.

4.3.7.2 Evaluate knowledge gained

Participants with high computer literacy, indicated how they would go about evaluating if they learned something from this task. They stated:

- *I will do the task again without help*
- *By being able to answer questions I didn't know*
- *To see if I can get the right answers for the questions, I got wrong on my own*
- *I will see the results*

One of the high computer literate participants stated, *I don't know.*

The responses from the low computer literate participants were similar to the answers of the high computer literate participants, their responses:

- *By doing it on my own*
- *If I do the task again, I will be better*
- *To go over the questions again*

- *See my results*
- *I don't know*

Participants with high computer literacy had similar responses as the participants with low computer literacy, both indicated they would do the task over to evaluate themselves to see if they gained knowledge.

4.3.7.3 Adaptive strategies

Participants had to indicate how they would change the way they interpreted the task when they started to improve for the next task or assessment. The high computer literate participants responded as follows:

- *To check the folders in the task and do the difficult one's first*
- *Check in my textbook where I went wrong and correct it*
- *If the one strategy didn't work, I will try something else*
- *To practice more and ask more questions*
- By doing it over and over

The low computer literate participants indicated that they would practice more and included the following:

- *I will practice more and start early*
- *To focus*
- *I will go through the task again and see if I can do it better*
- *To focus on the stuff, I didn't know*

High computer literate participants indicated that they would practice more and use another strategy in order to improve their results for the next task. Participants with low computer literacy stated that they would also practice more and start earlier with the task, they also indicated that they would redo the current task to evaluate if they can do it better than the first time.

Both participants (high and low computer literate) indicated that they would search on the computer if they don't know how to set a certain setting, they would play around on the computer or select the help option.

With regards to the assistance, both high and low computer literate participants indicated that they would ask the lecturer, classmates or friend and also check in their textbooks and notes. Participants with high computer literacy reflected that they would evaluate themselves by doing the sections that was difficult for them, it is important for them to improve on that they also indicated that they would look at their results and evaluate from that, the low computer literate participants had similar responses to the evaluation.

During the improve interpretation section, high computer literate participants indicated that they would try new strategies if the current one didn't work, while the low computer literate participants responded that they would work harder and start earlier also to ask questions if they don't understand.

4.4 Merging quantitative and qualitative analysis

In the quantitative section of this study, the 'Self-regulation in computer literacy' data was integrated with the qualitative data from the semi-structured interviews. The researcher did this to get a better understanding of how participants interpret computer literacy and to see how self-regulatory strategies can help improve computer literacy (see §4.1). The following sub-sections comes from the self-regulatory strategies that were identified in the questionnaire and interviews in this study, which were; goal setting, strategic planning, self-recording, self-evaluation and self-reaction.

4.4.1 Perceptions of computer literacy

The researcher could derive from the computer literacy test that some of the participants were not computer literate, because they could not answer general computer related questions such as what a folder is, input and output devices. Some of the participant could answer some questions in the test correctly. The average for the computer literacy scores were 52% out of a 100%, thus is clear that the population consisted of different types of participants which was also clear to the researcher that they came from different secondary educational backgrounds. More than half of the participants (52%) were unclear about general questions about the computer, which means their computer literacy are low. The researcher could determine that some of the participants had computer knowledge gained previously and others had none.

During the interview sessions, the researcher could see that it is difficult for some participants to define computer related terms and to differentiate between terms. All the participants responded that it is important for them to understand the computer in order to be successful and that it would be a benefit to them in the work industry. The researcher could also derive that some participants are fully reliable on the guidance and assistance of the lecturer, they

are too afraid to work on their own or ask questions. Participants experienced a feeling of fear when they are not able to do something on the computer or they when they do not understand certain instructions. Due to the fact that they lack computer literacy the feelings of fear and anxiety develops within them.

Whether participants had computer background or not, none of the participants were able to define and differentiate between different computer literacy terms. The researcher concluded, during the test and interview it was significant for the participants to understand the computer and to be able to be competent when completing a computer literate task or test. Participants believed if they are computer literate it would be a benefit for them when they are going into the work environment.

4.4.2 Goal setting

The researcher could derive from the quantitative data that participants can set goals to achieve their objectives. The more computer literate they are the easier it become for the participants to set goals for the assessment. The participants indicated that they finish their assignments before the cut off time (80.80% of the responses). More than 60% of the participants responded that they break up goals into attainable goals, 51.70% indicated that they set goals for each section and 80.80% responded that they prepare for a test or exam before the time. It is concluded that in the quantitative stage the researcher found that participants set goals, they break up their goals and they prepare before the time for tests or exams.

The responses from the participants who took part in the qualitative stage (interviews), shows the goal setting in computer literacy, if the different goal setting strategies differ between participants with high computer literacy and those with low computer literacy (see §4.3.2). Both participants with high and low computer literacy indicated that they set goals. Participants with high computer literacy set goals to achieve good results at the end, on the other hand participants with low computer literacy set goals to have a better understanding of the work at the end. During the interview session participants with high computer literacy indicated that they break up goals to organize different sections and in order to reach the main goal at the end of the task. In order to understand instructions, participants with high computer literacy responded that they read thoroughly to make sure that they understand instructions. Low computer literate participants indicated that they would practice more to achieve their goals.

In concluding goal setting for the quantitative and qualitative data, both high and low computer literate participants set goals, they break it up and prepare themselves in order to reach their goal at the end.

4.4.3 Strategic planning

In the quantitative stage, the strategic planning section identified that time management is important to participants to reach their goals. 76.80% of participants indicated that they work out a time frame to complete the task in order to complete it on time before the deadline. The majority (95.80%) of the participants indicated that they follow the guidelines in their study guide when they prepare for a task. Participants responded that they make sure what they need to study for a test (79.10%) before the time, to work out their time needed to complete it in time. Participants indicated that they had an action plan in place to achieve their goals.

In the qualitative stage, two sub-sections were used under strategic planning namely, time management and planning strategies. Under time management, participants with high computer literacy indicated that time management is important for them to reach their goal, they stated that if they don't work according to the time set, they will not reach their goal and loose marks. Participants with low computer literacy indicated that time management is important for them to finish in time to reach their goals. Both participants (high and low computer literate) indicated that they would set up a time table to manage their time effectively. The average time needed to complete the task for both high and low computer literate participants were 1 hour. The planning strategies participants would use to complete the task, were their notes and textbooks as guidelines when they prepare for the task. The researcher feels that the participants did not understand the question clearly. Both participants indicated that they would ignore interruptions while they are busy with the task or ask the lecturer to assist with the interruptions, their main focus were to finish the task.

It is clear for the researcher that participants know that time management is important and that they need to plan their time accordingly to reach their goal at the end. High computer literate participants focussed on allocating time frames for certain sections in the task in order to make sure they reach their goal at the end.

4.4.4 Self-recording

Participants in this study in the quantitative stage, indicated that they check their work afterwards to make sure it is correct. Some of the participants (65%) indicated, when they read certain course work, they stop to make sure they understand the concepts and aspects they have read. 68.30% of the participants indicated that they keep track of the time used to read or learn new concepts. Participants also indicated that they make notes of important aspects and 55% reported that they check if they reach the goal at the end.

In the qualitative stage under the self-recording sub-section, participants with high computer literacy reported that they keep track of the things that they don't understand and ask the

lecturer afterwards. They will also read again to make sure they don't understand before they ask for help. The low computer literate participants indicated that they would read the instruction more than once if they still don't understand they would check their notes and textbooks. Both participants (high and low computer literate) reported that they would motivate themselves by staying focussed, practice more and keep on trying until they get it right. All of the participants who participated in the interview reported that they would take responsibility to take leadership within an group, they would delegate and control the process, if one of the group members doesn't participate they would ask the lecturer to step in, but they would first try to do it on their own.

The main strategy that was identified as a self-recording skill in computer literacy was keeping track of progress. Participants indicated that they would keep track of their progress during the process of completing the task successfully. They would keep track of what they understand and start with that and also keep track of what they don't understand and focus on that afterwards.

4.4.5 Self-evaluation

During the quantitative data collection, the researcher derives from the questionnaire that 85.90% of the participants indicated that they have an idea of what mark they can expect at the end of an exam. Less than 50% of the participants indicated that they check their work to make sure it is right. 60% of the participants reported that they reflect on their work they submitted, then compare it with their end goal to determine if they accomplished what they planned to accomplish (their goals).

In the qualitative data collection, the researcher analysed what participants could do and could not do. The majority of the high computer literacy participants reported that they would check their answers in the textbook afterwards to determine what they could get right or wrong in the test or task. Participants with low computer literacy reported that they would focus on what they could do and only do that and afterwards check their textbook to check the once's that they could not do, to prepare them to do it for the next task or test. Both participants indicated that they would ask the lecturer or classmates if they don't understand certain terms, only a few indicated that they would google. High computer literate participants indicated that they would work harder to improve for the text task or test and practice more. The participants with low computer literacy reported that they would spend more time on the things they didn't do the first time and change the way they did it in order to improve for the next one.

In the quantitative data collection, the researcher found that participants fairly evaluated themselves. In the qualitative data collection, the researcher could derive that participants reflect on their performance all the time to make sure they reach their goal.

4.4.6 Self-reaction

In the quantitative stage, the researcher used the self-reaction strategy to analyse if participants know if they made a mistake or failed in order for them to improve or change their plan. The majority of the participants (68.30%) indicated if they don't understand what they read or study that they would go back and try to figure it out before they ask for help. 70.70% of the participants indicated that they would ask to reschedule if they realise, they don't have enough time to complete the task. The majority of the participants (90.80%) reported that they try to change the way that they study to fit the requirements of the course.

In the qualitative stage, the participants with high computer literacy reported that they would first try to figure out a certain setting or search on the computer before they ask for help. On the other hand, the low computer literate participants indicated that they would go to their textbook or ask the lecturer. Participants with high computer literacy indicated that they would evaluate themselves to determine if they learned something by doing the task again without help. The low computer literate participants indicated that they would evaluate themselves by doing the questions that they didn't know and do in the task; they would focus on that. High computer literate participants reported that they would try new strategies to improve interpretation if the current strategy didn't work. The low computer literate participants indicated that they would work harder and spend more time on the task to improve for the next task.

4.5 Conclusion

Chapter 4 attempted to analyse and interpret the data that had been gleaned from the quantitative and qualitative phases of this sequential explanatory mixed method study. The quantitative data were presented, followed by the interpretation of that qualitative data. The data from both phases were then merged into an integrated data set in order to explain the phenomena of computer literacy and self-regulation in this study.

Chapter 5 now follows where the findings are presented and recommendations for implementation and further research are discussed.

CHAPTER FIVE: SUMMARY, FINDINGS AND RECOMMENDATIONS

5.1 Introduction and statement of the problem

Technical and vocational education and training (TVET) institutions in South Africa are aimed at preparing students in their care, to be more productive and to develop skills of employability in these students (§1.3). A major drive in these institutions, in order to ensure the employability of the students, is to ensure that they are computer literate and thus able to be productive in the work force. The researcher noticed that many of the TVET students have a negative attitude toward the subject 'Computer Applications' and low computer literacy and began this study in order to determine the causes related to this. The key concern in this study was thus to determine if self-regulation could explain the levels of computer literacy of the study population.

The importance of self-regulation, which is rooted in the Social Cognitive Theory (§2.6) is emphasised by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world. Self-regulation could also refer to the degree to which students are proactive and responsible participants of their own learning process. (Zimmerman, 2008). Because of the changes in worldwide technology, students are expected to adjust the skills that they already possess and learn new skills in order to cope (Zimmerman, 2002: 64) (§2.6.2)

Previous research on academic self-regulation is seen to help clarify achievement differences among students and to improve achievement. Self-regulation refers to the ability of a student to understand and control his/her learning process and outcome (Schraw, Crippen & Harley, 2006). The researcher experienced that self-regulation is not always applied with student learning and sees it as the gap between self-regulation and computer literacy.

Paraskeva (2007) conducted research which aimed to determine the link between computer self-efficacy and self-regulated learning strategies while Neville and Bennett (2004) explored how self-regulation could lower the discomfort experienced by students while becoming fluent in information technology. Computer literacy is different though. Computer literacy can be defined as the ability to use computers at an adequate level for creation, communication and collaboration in a literate society (Son, Robb & Charismaidji, 2011:27) and is seen as one of the most important skills a person can have in today's competitive environment. William (2002) states that a person must have a clear understanding of computer characteristics, the different application programs (Microsoft Word, Excel, Access and PowerPoint) and skills to implement knowledge in an accurate and dynamic way. The 21st century has given rise to a digital

generation, who to be better prepared for the professional world, need to have computer literacy skills (§2.4) Thus this study was necessitated by the need to determine if the self-regulatory skills in relation to computer literacy had an impact on this perceived negativity of the students at a TVET college in the Western Cape province of South Africa.

5.2 Review of literature

5.2.1 Computer literacy

Computer literacy can be regarded as one of the most important skills a person can have in today's competitive environment. It is defined that one must have a clear understanding of computer characteristics, the different application programs (Microsoft Word, Excel, Access and PowerPoint) and skills to implement knowledge in an accurate and dynamic way (William 2002). Computers has become part of our everyday lives thus the need for proper training has become extremely essential (see §2.4).

Adeyinka and Mutala (2008) agree with the above by adding that computer literacy can be seen as knowing some basics using the computer for example to save and open a file, use a word processing program, send and receive e-mail etc. It would also mean to have some sort of comfort around computers rather than having some fear or a feeling of foreboding.

Computer literacy (see §2.4) was a term defined by Luehrmann (1981), who originally believed that computer literacy was equivalent to programming skills and the use of computer software such as word processing. The term was expanded later to cover a variety of computer skills. There were many professional groups attempting to define what computer literacy standards is. Capron and Johnson (2004) said that other literacy skills should also be included in such standards.

Adagunodo and Idowu (2004) indicate that knowledge, skills and confidence with computers are now an asset for entering the competitive employment market. Every part of life from education, work environment, social interactions and even vacations are influenced by computers. With the increasing use of computers in education, new skills and competencies among students are required for them to executively learn.

Computer literacy is the key ability that is of importance for independent studying, self-directed learning, life-long learning and social development. According to Pinto (2010) computer literacy is vital for the modern intensively information-based world and it also provide personal, economic, social and cultural development. The concept of computer literacy is also about the feeling one has when they work on the computer a feeling of fear or confidence.

Every part of life from education, work environment, social interactions and even vacations are influenced by computers. Murray and Blyth (2011) believe that a lack of computer skills is an issue which can hold back many of the academic opportunities. With the increasing use of computers in education, new skills and competencies among participants are required for them to executively learn. While some researchers define and measure computer literacy in terms of the number of computer courses completed, the amount of time spent on the computer, having a computer at home, others consider the knowledge with computer terms, experiences and ability.

5.2.2 Self-regulation from a social cognitive perception

Self-regulated learning in this study was determined by the nature of self-regulation as viewed by Zimmerman (2000). The way Zimmerman views self-regulated learning from a social cognitive perception, social cognitive theory is discussed, where after self-regulated learning is defined from a social cognitive perception, followed by a discussion of Zimmerman's (2000) model of self-regulation (see §2.5).

The importance of self-regulated learning is highlighted by the importance of developing not only subject knowledge, but higher-order thinking skills, critical thinking skills and life-long learning, so that students are able to prepare themselves for an ever-changing world (Zimmerman, 2002: 64).

This study is rooted in the work of Bandura (1986) and social cognitive theory (§2.6) Bandura, who developed social cognitive theory, views a person as self-organised, proactive, reflective and self-regulated. The social cognitive theory also address how instructions can apply the views to assist in the acquisition of computer literacy skills. Education is also undergoing a shift as curriculum developers attempt to adapt to the needs of 21st century students.

The rapid and ever-changing advances of technology are changing the way students relate with the world. Bandura (2002) stated that technology plays a large role in the globalization of human interconnectedness, thus influencing how students use and apply technology within their societal and cultural environments. Since learning environments are changing to include readily accessible technology and all the boundless resources associated with technology, it is only inevitable that educational theorists re-evaluate their learning theories, so they are applicable to how students are influenced by technology in the learning process.

Cognitive development is necessary for students to self-determine their outcomes. The mind does not simply react to the events of one's surroundings, but the mind also develops cognitive abilities that enable individuals to adapt, adjust and to function in a dynamic world (Bandura, 2000). Bandura (1999:23) states that cognitive processes are not only emergent brain

activities, they also exert determinative influence. The human mind is generative, creative, proactive, and self-reflective not just reactive. People operate as thinkers of the thoughts that serve determinative functions. They construct thoughts about future courses of action to suit ever-changing situations, assess their likely functional value, organize and deploy strategically the selected options, evaluate the adequacy of their thinking based on the effects which their actions produce and make whatever changes may be necessary.

Social cognitive theory used in student learning, holds that portions of an individual's knowledge acquisition can be directly related to observing others within the perspective of social interactions, experiences and other influences. Students observe others by performing a behaviour and the consequences of that behaviour, they remember the sequence of the events and use the information to guide the subsequent behaviours (Bandura, 2002). If students apply the social cognitive theory there will be improvement on their computer literacy, because they will be guided step by step through the process as mentioned above.

Zimmerman (2008) developed Bandura's concept of social cognitive theory and self-regulation further by distinguishing three cyclical phases of self-regulated learning: forethought (goal setting, strategic planning, self-efficacy thoughts, goal orientation and intrinsic interest), performance (attention focussing, self-instruction and self-monitoring) and self-reflection (self-evaluation, attributions, self-reactions and adaptivity) (Puustinen & Pulkkinen, 2001:277; Zimmerman, 1990; Zimmerman, 1998:4; Zimmerman, 2002). For the purposes of this study, the researcher used the model proposed by Zimmerman (2000a:16) of self-regulated learning as a way of explaining how the three processes of forethought, performance and self-reflection are cyclically maintained and adjusted (§2.6.2)

During the forethought phase, participants showed that they can focus on the importance of a specific task and how to use the content effectively. Participants was also able to set goals for themselves, engages strategic planning as to how they would go about to achieve the goal. Motivation is important to achieve goals and motivational beliefs falls under the self-efficacy of participants, what they would use or do to motivate themselves to achieve their goal. Participants linked self-efficacy with goal settings, as well as their personal influences from outside. There are two types of performance, self-control and self-observation. Self-control is all the processes that participants need to adhere to in order to reach their goal. Self-observation refers to self-evaluation, how participants evaluate their task at the end, also to judge how good or bad he/she performs a task.

In this study, the research attempted to determine if there was a difference between participants with high computer literacy and those with low computer literacy, and how these participants employed self-regulated learning strategies. This was accomplished through the

design of a sequential explanatory research design (§3.2.4) which employed a computer literacy test (§3.3.3.2.2), a 'Self-regulated learning in computer literacy' questionnaire (§3.3.3.1) in the quantitative phase and then aimed to come to a deeper understanding of the phenomena exposed in the quantitative phase of this study, by completing interviews with a smaller sample of the population (§3.4.1) in the qualitative phase.

5.3 Method of research

5.3.1 Research design

A sequential explanatory mixed-method design (see §3.2.4) was used for this study. The reason for selecting a sequential explanatory mixed-method design lies in the purpose of this research. This study aimed the quantitative design to investigate the phenomenon of self-regulation on participant's computer literacy by using a 'Self-regulation in computer literacy questionnaire' (see §3.3.1) and a computer literacy test, used the findings to plan the qualitative design by using semi-structured interviews.

5.3.2 Quantitative analysis

In this study the quantitative design used a questionnaire (see §3.3.1) as a research method, a self-regulation in computer literacy questionnaire and computer literacy test was used to allow the researcher to gather information from the participants. The data were analysed using descriptive statistics (§4.2.2 & §4.2.3).

5.3.2.1 Participants

By using purposive sampling, 120 N4 level students (see §3.3.2) of a single vocational college in the Western Cape were selected to participate in this study.

5.3.2.2 Instruments

In the quantitative stage of this study, two instruments were utilized (see §3.3.3) to collect information from the participants in this study: a 'Self-regulation in computer literacy' questionnaire and a computer literacy test. The questionnaire consisted of biographical information of the participants and the self-regulation in computer literacy questions followed. To test the computer literacy skills of participants, the researcher used the computer literacy test to gather information on the participants' knowledge of computers. The validity and reliability of the questionnaire was achieved (see §3.3.3.1.4) because the researcher was consistent when the questionnaire was developed.

5.3.2.3 Statistical analysis

The information gathered from the quantitative questionnaire were analysed using descriptive statistics (see §3.3.4) and these were converted for the researcher to obtain scores for the purpose of the quantitative interpretation. The statistical analyses of the data include the descriptive analysis scores: means, median, mode and standard deviations. The frequency tables included the questions, frequency percentage, valid percentage and cumulative percentage of the factors in the questionnaire

5.3.3 Qualitative analyses

The qualitative phase of this study followed after the quantitative phase had been completed. In relation to the quantitative section of the empirical research, a qualitative phase (see §3.4) of this study was conducted in order to further explore the themes identified in the quantitative phase.

5.3.3.1 Participants

By implementing interlaced sampling (see §3.4.2), 10% (n=12) of the quantitative participants were identified to take part in the qualitative interviews, those with high computer literacy (n=6) and those with low computer literacy (n=6). The purpose for identifying 10% of the quantitative population lay in the rationale using sequential explanatory mixed-method research design (see §3.2.4).

5.3.3.2 Data collection

The researcher set up semi-structured interview questions (see §3.4.3) in order to explore the data which had been highlighted in the quantitative phase. Interviews were conducted using a semi-structured interview schedule (see §3.4.3.1). The interview questions aimed to decide how the prearranged self-regulatory ideas of goal setting, strategic planning, self-recording, self-reflection and self-reaction are utilized when participants are engaging with computer literacy skills in the classroom (see §3.4.3.1). The researcher adapted Zimmerman and Martinez-Pons (1986:615) interview schedule in order to sort the interview questions applicable to the concepts in categories (see Table 3.3).

5.3.3.3 Thematic Analysis

The recorded interviews were first transcribed before analysis could occur. The data gathered were thematically analysed through the process of coding and categorizing (see §3.4.4).

5.4 Findings

The main research question in this study asked how the theory of self-regulation could help to explain why some participants have higher computer literacy skills than others, and in order to answer this question, the sub-questions will be answered first.

5.4.1 Sub research question 1: How do participants understand the concept of computer literacy and the importance thereof?

Computer literacy (see §4.3.1) is the capacity to use a computer and related technology proficiently. Computer literacy includes the feeling that one has when working on a computer, it can be a feeling of confidence, fear, anxiety or satisfaction.

All the participants indicated that computer literacy involves knowing about the computer and different programmes, although the data shows that neither participants with high or low computer literacy could define the term properly. This is evident in the average of the computer literacy test which was administered as it had an average of 52% for the group and it appears that the participants lack basic computer literacy. What most participants did indicate though, was that they feel very nervous when they have to work on computers, when they were assessed (§4.3.1.3) or when the lecturer asks questions. Most of the participants indicated that computer literacy is a necessary skill but often feel overwhelmed and afraid.

Participants with both high computer literacy and low computer literacy identified very specific challenges with regards to developing computer literacy. These can be summarised as follows: computers make them very nervous and they lack the confidence to work on computers, language barriers often mean that they cannot read or understand instructions, most of them do not have personal computers or laptops on which to practice and finally, due to personal circumstances, many of the participants often miss classes which exacerbates the problem further.

5.4.2 Sub research question 2: What differences currently exist with regards to self-regulated strategies between participants with high computer literacy and those with low computer literacy?

The analysis and merging of the data from the quantitative and qualitative phases of this study allowed the researcher to compare if differences currently exist between participants with high computer literacy and those with low computer literacy, and their use of self-regulatory skills. The self-regulatory strategies that were analysed in the qualitative section of this study were goal setting, strategic planning, self-recording, self-evaluation and self-reaction.

Both participants with high and low computer literacy indicated that goal setting (§4.4.2) does not appear to be an issue, and though the types of goals that they set differ, they do set goals for themselves. High computer literates set goals related to achieving good marks while those with low computer literacy set goals to understand the work and instructions given. High computer literates therefore are achievement driven while those with low computer literacy struggle to understand, and this is reflected in the types of goals that they set.

Both high and low computer literates engage in strategic planning when engaging in computer literacy exercises (§4.4.3) and indicted that they have time management plans in place in order to finish their work on time and to reach their goals. What was interesting to note though, was that the low computer literates prefer to rely on the lecturer for guidance.

Most of the participants, both high and low computer literates, indicated that they would engage in the self-regulatory skill of self-recording (§4.4.4) by keeping track of their progress, take notes and motivate themselves to stay on task. Self-recording does not appear to be in issue in the participants in this study. Those participants with high and low computer literacy were able to engage in the self-reflection (§4.4.5) skills of prediction, self-checking, reflecting and comparing the outcomes to the goals set.

Where the researcher did find discrepancies between the high computer literates and the low computer literatures was with regards to the self-regulatory skill of self-reaction (§4.4.6). Those participants with high computer literacy indicated that they would first try to figure out what was required of them and complete computer searches, before they ask for help, while those with low computer literacy tend to just ask the lecturer for help. High computer literates also indicated that they would use new or different strategies in order to improve their interpretation of the question or instruction, if the first strategy they used did not work. The low computer literates said that they would just try harder.

It is evident from the findings that participants with low computer literacy tend to rely on lecturer support far more than those with high computer literacy.

5.4.3 Main research question: How does the theory of self-regulation help to explain why some participants have higher computer literacy skills than others?

By analysing the data in both the quantitative and qualitative phases of this study and by answering the two sub-questions that were posed, the researcher will now answer the main research question.

The theory of self-regulation can help to explain why some participants have high computer literacy and others have low computer literacy. Both groupings were able to engage

successfully in task analysis skills and have the ability to use and set goals, they make use of the skill of strategic planning, especially with regards to time management and planning, although low computer literates tend to rely on the lecturer more. Furthermore, both cohorts are able to use self-recording strategies by checking their notes, taking notes, keeping track of things and asking for help. They are also both able to engage in self-evaluation and check their goals. But where self-regulation is able to explain the levels of computer literacy is in the self-reaction phase. Here there is a difference between what high computer literates do. High computer literates are able to try new things, work things out for themselves, try different strategies if they do not achieve their goals and work on their own. Low computer literates on the other hand always tend to ask for help rather than react and state that trying harder might produce a different result. High computer literates therefor engage in adaptive self-reaction.

There were other issues that came to the fore in this study that are not related to self-regulation and could help explain why the participants have such low levels of computer literacy. What the computer literacy test and interviews showed is that the participants do not understand exactly what computer literacy entails, that they are governed by fear of computers and that many of them do not have personal computers on which to practice. Self-regulation could help explain the fear experienced by the participants, but a study of self-efficacy and motivation was not the focus of this study.

Furthermore, half of the participants in this study are isiXhosa speakers and a third of the cohort are Afrikaans speakers. That means that 80% of the population are being taught in a language that is not their home language. Language issues have come to the fore in this study, as the participants have indicated that they often do not understand what is expected of them.

So to summarise, factors that are not related to self-regulation, but lead to lower levels of computer literacy in this study are: lack of computer knowledge and access to computers on which to practice and issues related to language of instruction and understanding.

5.5 Limitations of the study

- The first limitation of this study is the lack of investigation into the self-regulatory skills of self-efficacy and motivation. Due to time constraints and researcher interest, these factors were not explored. More research is required.
- The second limitation in this study relates to the use of English as medium of communication. It is feared that many of the participants did not answer the ‘Self-regulation in computer literacy’ accurately because they did not understand the English

questions. It is for this reason, that the findings of this study cannot be generalised to the greater population.

- A further limitation of this study is that it was conducted on a small scale, in a very context specific environment and as such, cannot be generalised to the greater population.
- The final limitation of this research study is that the 'Self-regulation in computer literacy' did not undergo a factor analysis and as such cannot be used in other studies as a validated instrument.

5.6 Recommendations

5.6.1 Recommendations to improve the current research

- The first recommendation to improve the current research study would be to include items regarding self-efficacy and motivation in the 'Self-regulation for computer literacy' questionnaire. A full investigation of the anxiety and fear experienced by participants with regards to computer usage should be investigated.
- The second recommendation to improve the current research would be to translate the data collection instruments into isiXhosa and Afrikaans, so that the participants have a better chance of really understanding what is being asked.
- The third recommendation would be to investigate the relationship between computer literacy, use of computers and the accessibility of personal computers.
- A final recommendation to improve the current research study, would be to conduct a factor analysis of the 'Self-regulation in computer literacy' questionnaire in order to determine the validity and transferability of the questionnaire.

5.6.2 Recommendations for future research

- It is recommended that further research be conducted on the motivational aspects of self-efficacy in self-regulation and the role that this plays in the development of computer literacy.
- Further research should be conducted on the role that language plays in the development of computer literacy.
- Further research should also be conducted on the relationship between computer literacy and the access that students have to personal computers or laptops.

- The validation of the ‘Self-regulation in computer literacy’ questionnaire could be a project for future research.

5.6.3 Implications for TVET colleges and educational institutions

In this study the implications for TVET colleges and educational institutions are as follows:

- This study offers an explanation for which self-regulatory skills are being employed by the current population in this context. The first implication is that TVET colleges need to develop a programme which reinforces the self-regulatory skills of goal setting, strategic planning, self-recording and self-reflection, and these should be built into the curriculum. The self-regulatory skills of adaptive reaction should be introduced into the curriculum with and taught explicitly, as these are lacking.
- This study highlights the fact that many participants do not own personal computers or laptops. TVET colleges should try to remedy this situation by providing more opportunities for computer practice on campus, during and after hours.
- Tutors should be appointed by TVET colleges in order to provide further training outside of the classroom situation, and as such, alleviate the fear associated with the subject.
- TVET colleges should consider a multi-lingual approach to teaching Computer Practice specifically, in order to increase the knowledge base of computer literacy, as this jargon rich subject appears to present comprehension problems for the participants in this study as they struggle to understand the subject in English.

5.7 Concluding thoughts

In today’s world it is extremely important to be computer literate because computers have become part of our everyday lives. In order for students to have a successful academic learning outcome, prime factors such as motivation, commitment and self-regulation strategies are needed. Together with the prime factors, the input and support from the educator would also lead to promoting academic achievements and life-long learning. If educators want to build successful life-long students, the educators need to make sure that they educate, demonstrate and facilitate the plan of action (strategies) designed to achieve their goal. In the opinion of the researcher, she perceives that educators should analyse the views and opinions of students with regards to their learning. The researcher goes further by suggesting that educators pay attention to self-efficacy of students to become aware of motivational difficulties before they become problematical. Educators should encourage self-monitoring, integrate

opportunities for self-directed reflection, allow students to make decisions that will positively impact their learning and permit students to seek for help.

The process of self-regulated learning in computer literacy is managed by the students. As seen in the findings above the quantitative and qualitative analyses shows how the forethought, performance and reflection process influences students with high and low self-regulation. Goal setting, strategic planning, self-recording, self-evaluation and self-reaction strategies can be acquired from educators and different models, self-regulated students will ask for assistance from the above mentioned to improve their knowledge, skills and learning.

Through professional development from the government, technology can be upgraded and laptops be given to students, which will help educators to use different types of technology to improve student learning in the classroom.

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APPENDIX 1: Self-regulation in computer literacy questionnaire

The following questionnarie consists of a number of statements related to computer literacy. Read each statement and then mark one of the following choices:

Key				
1	**2**	**3**	**4**	**5**
Not at all like me	**Not very much like me**	**Fairly much like me**	**Much like me**	**Very much like me**

Please completely cross the appropriate numbers that best describes you. For example, cross the 3 if you feel that the statement is fairly typical of you.

1	2	3	4	5

Try to rate yourself according to how well the statement describes you, not in terms of how you think you should be or what others do. There are no right or wrong answers to these statements. Please work as quickly as you can without being careless and please complete all items.

1. After having prepared for a Computer Practice exam, I have a good idea of what marks I can expect for the final exam.
2. I complete my Computer Practice assignments before the cut-off dates.
3. When I become confused about something I am reading my notes I made during the explanation of that section or I go back and try to figure it out.
4. When I practice my computer skills, I make notes regarding important aspects of the work I'm practicing.
5. I check over my work on the computer to make sure I did it correctly.
6. When I realise that I haven't set enough time to complete a practical task or assignment on the computer, I reschedule my time.
7. When I set a goal I can't reach, I usually break it up in more attainable goals and work at them one at a time until I reach my initial goal.

8. Before doing a Computer Practice assignment, I first read as much on the topic as I can.

9. When I realise that I don't understand the instructions I am reading, I go back to my notes and check what the steps is to complete the question.

10. When I have to do a Computer Practice assignment, I work out how much time it will take to complete the assignment.

11. When I have to do a Computer Practice assignment, I make sure that I know what is expected of me.

12. I set specific goals for each section of my work.

13. If I realise that I can't solve a problem, I ask someone for help.

14. I first work out the formulas before I insert a calculation in an excel question in the exam.

15. When I have written a theory test for Computer Practice, I usually have a good idea of how well I have done, before the test has been marked.

16. I start early to prepare for a Computer Practice test.

17. I ask myself questions to make sure I understand the material I have been studying.

18. I try to work at a constant tempo.

19. Before I begin practicing I think about the things I will need to do to learn.

20. When doing a Computer Practice assessment, I make sure that I know the meaning of all the manuscript signs according the book in order to complete the assessment.

21. While practicing, I test myself by adding extra manuscript signs to the activity to check if I understand the work.

22. When I prepare for a Computer Practice test, I make sure that I know precisely on what the test will be and what type of questions will be asked.

23. Before I practice functions or signs thoroughly, I often try to do it on my own before I ask for help.

24. I prefer to set short term goals.

25. After completing a Computer Practice assignment, I check my work to make certain it is correct before I print.

26. When practicing I try to determine the concepts I don’t understand well.

27. Before doing a Computer Practice assignment, I speak to others who know more about Computers than I do.

28. When I'm reading course work, I stop once in a while and go over what I have read.

29. When I study, I keep a record of the manuscript signs or facts I can’t remember or understand.

30. When practicing, I keep track of the time it takes me to complete a question or section in a question paper.

31. I often find that I have been practicing for some time but don’t know how to do certain instructions.

32. I try to change the way I practice to fit the subject requirements and the lecturer’s teaching style.

33. Before doing a Computer Practice assignment or start preparing for a test/exam, I set a goal which I plan to attain with the assignment or test/exam.

34. During contact sessions, I make notes of important aspects of the work we discuss.

35. When reading the instructions of a question, I try to only focus on what they ask and not adding or creating my own instructions.

36. I usually check if I have attained all the objectives or outcomes.

APPENDIX 2: Self-regulation in computer literacy answer sheet

Please completely cross the appropriate numbers that best describe you. For example, cross the 3 if you feel that the statement is fairly typical of you.

1	2	~~3~~	4	5

	Not at all like me	Not very much like	Fairly much like me	Much like me	Very much like me
1.	1	2	3	4	5
2.	1	2	3	4	5
3.	1	2	3	4	5
4.	1	2	3	4	5
5.	1	2	3	4	5
6.	1	2	3	4	5
7.	1	2	3	4	5
8.	1	2	3	4	5
9.	1	2	3	4	5
10.	1	2	3	4	5
11.	1	2	3	4	5
12.	1	2	3	4	5
13.	1	2	3	4	5
14.	1	2	3	4	5
15.	1	2	3	4	5
16.	1	2	3	4	5
17.	1	2	3	4	5
18.	1	2	3	4	5
19.	1	2	3	4	5

	Not at all like me	Not very much like	Fairly much like me	Much like me	Very much like me
21.	1	2	3	4	5
22.	1	2	3	4	5
23.	1	2	3	4	5
24.	1	2	3	4	5
25.	1	2	3	4	5
26.	1	2	3	4	5
27.	1	2	3	4	5
28.	1	2	3	4	5
29.	1	2	3	4	5
30.	1	2	3	4	5
31.	1	2	3	4	5
32.	1	2	3	4	5
33.	1	2	3	4	5
34.	1	2	3	4	5
35.	1	2	3	4	5
36.	1	2	3	4	5

20.

1	2	3	4	5

APPENDIX 3: Computer literacy test

CHOOSE THE CORRECT ANSWER FOR EACH QUESTION AND PUT A ☒ IN THE BOX

1. What is a folder?

A. A document on a disk ☐

B. A window on a desktop ☐

C. A collection of files grouped together ☐

2. What is the main brain of the computer?

A. CPU ☐

B. LAN ☐

C. ALU ☐

3. Which one is not an output device?

A. Speaker ☐

B. Monitor ☐

C. Printer ☐

4. Which one is the permanent memory of a computer?

A. RAM ☐

B. ASCII ☐

C. ROM ☐

5. Select a peripheral?

A. motherboard ☐

B. Keyboard ☐

C. Analogue computers ☐

6. Which one is not a portable computer?

A. microcomputer ☐

B. Main frame computer ☐

C. Laptop ☐

7. The smallest multi-purpose computer?

A. Main frame computer ☐

B. Minicomputer ☐

C. Personal computer ☐

8. Allows computer information to be transmitted and received via a telephone line?

A. Modem ☐

B. Scanner ☐

C. Copier ☐

9. ..... is one of the most popular output devices because it produces hard copies of the information on your computer.

A. Speaker ☐

B. Printers ☐

C. Mouse ☐

10. The most commonly used input device is ……..?

A. Mouse ☐

B. Keyboard ☐

C. Joystick ☐

11. CPU stands for……?

A. Central Package Unit ☐

B. Core Processing Unit ☐

C. Central Processing Unit ☐

12. Which of the following is NOT a printer?

A. Portrait ☐

B. Laser ☐

C. Inkjet ☐

13. The process of communicating with the computer

A. Software ☐

B. DVD ☐

C. Input ☐

14. Software designed to do a specific task like word processing or spreadsheets

A. System Software ☐

B. Application Software ☐

C. Monitor ☐

15. Hand-held device that controls the pointer on the screen

A. Keyboard ☐

B. Scanner ☐

C. Mouse ☐

16. What is it called when a computer connects to a network?

A. Online ☐

B. Inline ☐

C. Linked ☐

17. Which one of these is a light, portable, storage device?

A. CD Drive ☐

B. DVD Drive ☐

C. USB Flash Drive ☐

18. It is legal to download copyrighted music only if the song's copyright holder has granted permission for users to download and play the song

TRUE ☐ FALSE ☐

19. A portable media player allows users to exchange messages with other connected users

TRUE ☐ FALSE ☐

20. An entertainment website contains factual information

TRUE ☐ FALSE ☐

21. ASDF JKL; of the keyboard are called the home keys

TRUE ☐ FALSE ☐

22. Input, processing, output and storage are the steps in the information processing cycle

TRUE ☐ FALSE ☐

MICROSOFT WORD

23. Landscape is page orientation

TRUE ☐ FALSE ☐

24. The short cut key for line break is Shift + Enter

TRUE ☐ FALSE ☐

25. By pressing F12 on the keyboard, the Save As dialog box will open

TRUE ☐ FALSE ☐

26. Which of the following is not available on the ruler of MS Word screen?

A. Tab stop box

B. Left indent

C. Right indent

D. Center indent

27. Which is not a type of margin?

A. Top

B. Left

C. Right

D. Center

28. What is the default font size of a Word document based on normal template?

A. 8pt

B. 10pt

C. 12pt

D. 14pt

29. What keystroke combination selects the entire document?

A. Ctrl + A

B. Alt + F8

C. Shift + Ctrl + A

D. Alt + A

30. You can search a word document for

A. Formatting

B. Special characters

C. Phrases

D. All of the above

MICROSOFT EXCEL

31. On an Excel sheet the active cell is indicated by?

A. A dotted border

B. A dark wide border

C. A blinking border

D. By italic text

32. A spreadsheet contains?

A. Columns

B. Cells

C. Rows and columns

D. None of the above

33. Which among the following is associated with MS Excel?

A. Graphic program

B. Spreadsheet

C. Presentation

D. Word Processor

34. Which types of charts can Excel produce?

A. Line graphs and pie charts only

B. Bar charts, line graphs and pie charts

C. Only line graphs

D. Bar charts and line graphs only

35. The intersection of row and column is called a?

A. Dataset

B. Cell

C. Data

D. Set

APPENDIX 4: Memorandum of computer literacy test

1. What is a folder?

A. A document on a disk ☐

B. A window on a desktop ☐

C. A collection of files grouped together ☐

2. What is the main brain of the computer?

A. CPU ☐

B. LAN ☐

C. ALU ☐

3. Which one is not an output device?

A. Speaker ☐

B. Monitor ☐

C. Printer ☐

4. Which one is the permanent memory of a computer?

A. RAM ☐

B. ASCII ☐

C. ROM ☐

5. Select a peripheral?

A. motherboard ☐

B. Keyboard ☐

C. Analogue computers ☐

6. Which one is not a portable computer?

A. microcomputer ☐

B. Main frame computer

C. Laptop

7. The smallest multi-purpose computer?

A. Main frame computer

B. Minicomputer

C. Personal computer

8. Allows computer information to be transmitted and received via a telephone line?

A. Modem

B. Scanner

C. Copier

9. ..... is one of the most popular output devices because it produces hard copies of the information on your computer.

A. Speaker

B. Printers

C. Mouse

10. The most commonly used input device is ……..?

A. Mouse

B. Keyboard

C. Joystick

11. CPU stands for……?

A. Central Package Unit

B. Core Processing Unit

C. Central Processing Unit

12. Which of the following is NOT a printer?

A. Portrait

B. Laser

C. Inkjet

13. The process of communicating with the computer

A. Software

B. DVD

C. Input

14. Software designed to do a specific task like word processing or spreadsheets

A. System Software

B. Application Software

C. Monitor

15. Hand-held device that controls the pointer on the screen

A. Keyboard

B. Scanner

C. Mouse

16. What is it called when a computer connects to a network?

A. Online

B. Inline

C. Linked

17. Which one of these is a light, portable, storage device?

A. CD Drive

B. DVD Drive

C. USB Flash Drive

18. It is legal to download copyrighted music only if the song's copyright holder has granted permission for users to download and play the song

TRUE ☐ FALSE ☐

19. A portable media player allows users to exchange messages with other connected users

TRUE ☐ FALSE ☐

20. An entertainment website contains factual information

TRUE ☐ FALSE ☐

21. ASDF JKL; of the keyboard are called the home keys

TRUE ☐ FALSE ☐

22. Input, processing, output and storage are the steps in the information processing cycle

TRUE ☐ FALSE ☐

MICROSOFT WORD

23. Landscape is page orientation

TRUE ☐ FALSE ☐

24. The short cut key for line break is Shift + Enter

TRUE ☐ FALSE ☐

25. By pressing F12 on the keyboard, the Save As dialog box will open

TRUE ☐ FALSE ☐

26. Which of the following is not available on the ruler of MS Word screen?

A. Tab stop box ☐

B. Left indent ☐

C. Right indent

D. Centre indent

27. Which is not a type of margin?

A. Top

B. Left

C. Right

D. Centre

28. What is the default font size of a Word document based on normal template?

A. 8pt

B. 10pt

C. 12pt

D. 14pt

29. What keystroke combination selects the entire document?

A. Ctrl + A

B. Alt + F8

C. Shift + Ctrl + A

D. Alt + A

30. You can search a word document for

A. Formatting

B. Special characters

C. Phrases

D. All of the above

MICROSOFT EXCEL

31. On an Excel sheet the active cell is indicated by?

A. A dotted border

B. A dark wide border

C. A blinking border

D. By italic text

32. A spreadsheet contains?

A. Columns

B. Cells

C. Rows and columns

D. None of the above

33. Which among the following is associated with MS Excel?

A. Graphic program

B. Spreadsheet

C. Presentation

D. Word Processor

34. Which types of charts can Excel produce?

A. Line graphs and pie charts only

B. Bar charts, line graphs and pie charts

C. Only line graphs

D. Bar charts and line graphs only

35. The intersection of row and column is called a?

A. Dataset

B. Cell

C. Data

D. Set

APPENDIX 5: Semi-structured interview questions

Explain how you decide on your goals?

2. How do you organize your goals?
3. How do you plan to achieve your goals?
4. Why is achieving your goals important for you?
5. How will you benefit from reaching your goals?
6. How will you stay focussed during the process to achieve your goals?
7. What challenging goals do you set for yourself?
8. Who will support you to achieve your goals?

9. Why is time management important for you?
10. What strategies do you use if you do an assignment?
11. How do you check if you have reached your goals?
12. How would you handle interruptions while you are busy with your assignment?
13. What are some good time management skills
14. Tell me about the most useful technique you have for managing your time?

15. What type of questions do you ask yourself to make sure you know your work?
16. What do you do if you don't understand your work?
17. How would you know how good or bad you have done after a test?
18. How to you motivate yourself?
19. If you work in a group and you are the leader, how would you make sure that the rest of the group members do their part and that the group submit on time?

APPENDIX 6: Computer literacy test results – Group A

Research no	Student no	CKT 100%
A1	131800291	**20%**
A2	131800274	**43%**
A3	131800360	**51%**
A4	131800262	**46%**
A5	131800280	**46%**
A6	131804106	**63%**
A7	131800254	**49%**
A8	131800777	**63%**
A9	131600155	**57%**
A10	131800422	**57%**
A11	131800352	**43%**
A12	131800341	**37%**
A13	131800295	**57%**
A14	131800737	**60%**
A15	131800292	**60%**
A16	131800448	**40%**
A17	131800276	**60%**
A18	131800521	**66%**
A19	131504835	**69%**
A20	131800398	**37%**
A21	131800792	**77%**
A22	131408823	**29%**
A23	131800269	**31%**
A24	131800387	**34%**
A25	131800329	**40%**
A26	131601287	**46%**
A27	131800453	**46%**
A28	131504540	**26%**
A29	131800253	**54%**
A30	131800304	**23%**

APPENDIX 7: Computer literacy test results – Group B

Research no.	Student no	CKT 100%
B1	131802738	**60%**
B2	131800343	**34%**
B3	131800339	**49%**
B4	131800451	**71%**
B5	131805207	**49%**
B6	131800759	**54%**
B7	131800256	**43%**
B8	131800313	**57%**
B9	131800270	**60%**
B10	131800714	**51%**
B11	131800275	**57%**
B12	131800765	**60%**
B13	131800727	**60%**
B14	131800396	**17%**
B15	131800742	**60%**
B16	131800439	**54%**
B17	131801020	**63%**
B18	131606954	**51%**
B19	131800404	**63%**
B20	131801019	**63%**
B21	131800761	**66%**
B22	131707539	**49%**
B23	131800723	**69%**
B24	131801132	**69%**
B25	131800562	**80%**
B26	131800278	**71%**
B27	131800766	**46%**
B28	131800335	**60%**
B29	131800739	**74%**
B30	131800774	**29%**

APPENDIX 8: Computer literacy test results – Group C

Research no.	Student no	CKT 100%
C1	131800769	**69%**
C2	131800267	**66%**
C3	131800418	**69%**
C4	131800478	**66%**
C5	131608009	**63%**
C6	131800283	**49%**
C7	131801025	**60%**
C8	131800786	**40%**
C9	131800993	**60%**
C10	131800798	**49%**
C11	131800794	**51%**
C12	131800369	**29%**
C13	131700498	**31%**
C14	131800704	**60%**
C15	131800354	**51%**
C16	131800375	**34%**
C17	131800438	**46%**
C18	131800380	**49%**
C19	131800755	**51%**
C20	131800711	**51%**
C21	131800442	**51%**
C22	131800801	**54%**
C23	131800290	**57%**
C24	131800432	**57%**
C25	131800752	**63%**
C26	131800763	**63%**
C27	131800306	**66%**
C28	131801057	**69%**
C29	131800745	**66%**
C30	131800322	**51%**

APPENDIX 9: Computer literacy test results – Group D

Research no.	Student no	CKT 100%
D1	131800715	**49%**
D2	131800308	**74%**
D3	131804065	**80%**
D4	131800633	**43%**
D5	131800961	**66%**
D6	131800803	**40%**
D7	131800311	**57%**
D8	131801067	**57%**
D9	131800676	**26%**
D10	131800658	**46%**
D11	131800729	**60%**
D12	131800336	**43%**
D13	131800331	**46%**
D14	131800712	**54%**
D15	131800376	**63%**
D16	131800319	**54%**
D17	131800320	**29%**
D18	131800902	**60%**
D19	131800314	**54%**
D20	131800330	**40%**
D21	131801040	**46%**
D22	131800363	**71%**
D23	131800286	**46%**
D24	131601029	**23%**
D25	211001026	**29%**
D26	131800456	**34%**
D27	131800639	**49%**
D28	131500705	**51%**
D29	211004013	**57%**
D30	131800760	**49%**

APPENDIX 10: Permission letter

Ms LC Elias
06 Cedar Avenue
New Orleans
PAARL
7646

02 March 2017

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
Private bag X174
PRETORIA
0001

Dear TVET Management

LETTER OF INFORMED PERMISSION

I am pursuing my Master's degree in Education at Cape Peninsula University of Technology. My research topic, The role of self-regulation in the development of computer literacy at a vocational college in the Western Cape. The aim of the study is to gain a deeper understanding of self-regulated learning and students' computer literacy skills when computers are integrated into course delivery at a vocational college in Cape Town.

I therefore request your sincere approval to do the research at a vocational college in Cape Town (Northlink College, Tygerberg Campus). The research report will be confidential to the TVET college. I have compiled questionnaires and interview questions to conduct my research. The respondents for this investigation will be the Computer Practice N4 students in the Business Studies faculty on the Tygerberg Campus.

I depend on the results of the questionnaires in order to complete my findings in my research study.

I am looking forward to your response.

Kind Regards
Loren Elias

Ms LC Elias
06 Cedar Avenue
New Orleans
PAARL
7646

10 March 2017

Northlink College
Tygerberg Campus
Rothschild Road
PANORAMA
7500

Dear Senior Management

LETTER OF INFORMED PERMISSION

I am currently pursuing my Master's degree in Education at Cape Peninsula University of Technology. My research topic, The role of self-regulation in the development of computer literacy at a vocational college in the Western Cape. The aim of the study is to gain a deeper understanding of self-regulated learning and students' computer literacy skills when computers are integrated into course delivery at a vocational college in Cape Town.

I therefore request your sincere approval to do the research at Northlink College, Tygerberg Campus. The research report will be confidential to the college. I have compiled questionnaires and interview questions to conduct my research. The respondents for this investigation will be the Computer Practice N4 students in the Business Studies faculty on the Tygerberg Campus.

I depend on the results of the questionnaires in order to complete my findings in my research study.

I am looking forward to your response.

Kind Regards
Loren Elias

LC Elias
06 Cedar Avenue
New Orleans
Paarl
7646

31 March 2017

Dear Student

PARTICIPATION IN A RESEARCH STUDY

Currently I, Loren Caron Elias, am studying my M.Ed degree in Education at the Cape Peninsula University of Technology. I wish to conduct a research study entitled: The role of self-regulation in the development of computer literacy at a vocational college in the Western Cape. My supervisor is Dr. C Livingston. The aim of the research is to gain understanding and insight into the problems and achievements of students, who face difficulty and how they develop and show flexibility and self-regulation.

The Computer Practice N4 students from the Business Studies Faculty of were selected to participate in this study. You are hereby invited to participate in the above-mentioned research.

The reason for this letter is to inform and get permission from you, the student to participate in this research which includes the completion of a questionnaire and selective interviews. Strict measures will be taken in order to protect your autonomy and confidentiality. Participation in this study is voluntary, and you have the right to withdraw your participation at any stage of the research should you wish to do so, with no consequences. Your human rights will always be respected.

Should you agree, you are hereby informed to assent to your participation in this research.

Thank you very much for your kind support.

Signed at ..... on the …..... day of ..... 2017.

_____ SIGNATURE OF STUDENT

_____ LC. ELIAS (Researcher) M.Ed (Education)

Student no: 208180486